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Administration of Federal Power Projects

By C. HERMAN PRITCHETT *

GIVEN the New Deal power policy and the death sentence for public utility holding companies, it was inevitable that the federal government would eventually become the biggest electric power enterpriser in the country. The war has speeded up that process. Additional generators are being installed at existing federal power projects—T.V.A., Bonneville, Grand Coulee, Boulder—as fast as they can be manufactured. Three major storage dams and several minor ones have been added to the T.V.A. program. The Central Valley project, with power capacity increased, is being pushed to completion. A state power agency, the Grand River Dam Authority, has been taken over by the federal government to meet the necessities of war production. Power generating facilities are being built in connection with a number of the war plants of the Defense Plants Corporation, and ownership is likely to remain with the government after the war is over in at least some cases. The giant St. Lawrence development has apparently been abandoned for the duration, but it remains a distinct possibility for the future. All in all, the federal government seems definitely slated to be the "power trust" of the post-war period.

When that time comes, there is likely to be some re-examination of the federal government's position as a power enterpriser. For it has gone into the power business through a variety of agencies, no two of which have adopted the same pattern of operation, organization and administration. For purposes of this discussion, attention may be limited to the three most important federal organizations active in the power field: the T.V.A., with 23 dams built or being built and a planned capacity of about two million kilowatts by 1944; the Bonneville Power Administration, marketing the power generated by the Columbia River Dams at Bonneville and Grand Coulee, the combined capacity of which is expected to reach a million and a half kilowatts by 1944, with

* Assistant Professor of Political Science, University of Chicago.

room for the installation of another million kilowatts of generating capacity at Grand Coulee; and the Bureau of Reclamation, whose biggest power asset is Boulder Dam (ultimate capacity, 1,322,300 kilowatts, to be attained in 1945), which will be supplemented soon by the Central Valley dams and the Army Engineers' Fort Peck Dam, for which the Bureau of Reclamation is to act as marketing agent.

The differences among these three agencies are many and varied, extending to such important matters as their form of organization and their policies and practices affecting financing, rates, accounting, personnel and general public responsibility. The principal uniformities are that none of the agencies undertakes retail distribution of power, and that they have all been hydroelectric projects. It should be noted, however, that about one-fourth of T.V.A. generation is now from steam plants, and that at Central Valley the Bureau of Reclamation for the first time in its history is planning a large steam plant to firm up Shasta Dam power.

Because of the variety of administrative experience at these federal power projects, a comparative analysis should be of considerable value. While it may not always be possible to draw definite conclusions as to best practices from such a comparison, at least further appraisal is facilitated and alternatives to be considered in adopting a long-term policy for federal power operations are indicated.

Organization and Control

Organization for the generation and marketing of federal power has been conditioned by the fact that all federal hydroelectric plants are parts of larger multiple-purpose projects, the other purposes served by the same developments being flood control, navigation or irrigation. Under these circumstances, the power section of the enterprise may be administered either by the same agency that is responsible for the rest of the development, or by a separate power organization. The T.V.A. and the Bureau of Reclamation follow the first alternative; the Bonneville Administration exemplifies the second. There were special reasons for the separate power organization at Bonneville, however. The Bonneville Dam was under the jurisdiction of the Army Engineers, and it seemed undesirable to charge them with carrying on a commercial power program. Later on, when the Bureau of Reclamation's dam at Grand Coulee began generation, the Bonneville Administration became the marketing agency for both dams, thus solving the dilemma presented by the fact that the dams, though in the same watershed and locality, were under the control of separate federal departments.

Barring special considerations of this sort, there seems little reason why power should be administered separately from other aspects of a multiple-purpose development. It might be urged, however, that the increasingly important federal interest in power and the desirability of uniform policies at the various projects require national rather than regional administration. If that were the goal, all federally-owned powerhouses and transmission systems might be brought under a federal power agency, headed by a presidential appointee of cabinet rank, or under a power bureau in the Department of the Interior. Such a course would seem hardly wise or necessary, however. It would be inconsistent with the national policy for private power companies, which are being broken up into smaller

and more rational units. It would be contrary to the philosophy of the most successful federal power project, the T.V.A., whose present chairman has for years been preaching the gospel of "grass roots" administration of federal functions. It would mean increased centralization at a time when the burdens on Washington are already too heavy.

If the idea of a single central power agency is rejected, there remain the problems of effective regional administration. On what basis are regions to be determined? So long as federal power is principally hydroelectric power, watersheds seem to constitute an acceptable basis. The T.V.A. and the Bonneville Administration operate on this principle, and there have been numerous other proposals for the establishment of power and regional development authorities on a river valley basis. On the other hand, the Bureau of Reclamation has for its region the entire western part of the country, and the application of the watershed principle to this agency would require it to give up Boulder Dam to a Colorado River Authority, to set up the Central Valley activities as a separate project, and so on.

There are other organizational issues raised by the experience of these three federal power agencies. Is an independent board of the T.V.A. type, outside the regular departmental structure, to be preferred to the bureau status of the Bonneville Administration and the Reclamation Bureau? The administrative thinking of the past twenty-five years has been stressing the dangers in administrative disintegration which results when autonomous boards operate outside the effective control of a responsible chief executive. From this point of view the Bonneville Administration, which has most of its important decisions made for it or reviewed by Secretary Ickes in Washington, would be preferred to the T.V.A. arrangement of a quasi-independent board operating from Knoxville and responsible to no executive authority save the President, with whom there obviously can be only infrequent contact. Such a conclusion, however, would overlook the great difference in the activities of the two agencies. Departmental responsibility would be fatal to the T.V.A. scheme of operations, for regional autonomy is the essence of its regional development program which could never have been generated within traditional departmental lines. At Bonneville, where the administrative task is limited simply to the disposing of power, Senator Norris has battled in vain for the setting up of a T.V.A.-type board. The administration-supported, Bone-Wallgren bill, which provides for the establishment of a Columbia Power Administration to replace the provisional Bonneville Administration, accepts the principle of responsibility to the Department of the Interior.

The T.V.A. is also set off from the other federal power agencies by its corporate status. It has been generally assumed that the business corporation is the most appropriate implement for the government to use in undertaking a commercial service; and the device has been quite popular both in this country and abroad. While it is true that government corporations in the United States have usually possessed certain characteristics which assisted their business operations, it is also true that practically all the same advantages can be secured for an ordinary bureau by appropriate legislation.[1] The Columbia Power Administration bill previously mentioned

[1] Cf., C. H. Pritchett, "The Paradox of the Government Corporation," *Public Administration Review* (1941), pp. 381-9.

contains provisions which would give to this non-corporate agency more freedom from government "red tape" than the T.V.A. has been able to secure. Organization as a corporation would seem to be desirable for a federal power project, principally for its psychological effect, but is not essential.

Should regional power-operating agencies be subjected to the regulatory control of the Federal Power Commission? A start was made in this direction in the Bonneville Act of 1937, which provided that the allocation of costs to power at Bonneville Dam should be made by the Federal Power Commission which was also required to approve the rate schedules set by the Bonneville Administration. The T.V.A. and the Bureau of Reclamation are not subject to such controls, and when the question was raised in 1936 the T.V.A. objected strongly to coming under the jurisdiction of the Commission. However, as a long-term policy it might well be urged that Commission control over rates was a desirable precaution to prevent regional operating agencies from being forced by popular pressures into competitive rate-cutting in order to advance the interests of their particular regions.

Financing

It is rather generally agreed that in selling electric power the federal government is acting in a commercial rather than in an eleemosynary capacity, and that consequently the guiding principle in financing should be to treat these projects as self-supporting activities which, though not operated for profit, are expected to earn from revenues all proper charges against the activity. If the project is to be subsidized from general federal revenues, that fact should be clearly understood, the amount of the subsidy should be known, and the social good to be attained by the subsidized operations should be readily recognizable.

Application of the principle of commercial financing would require that funds for the construction or acquisition of power projects by the federal government be secured through the issuance of bonds, security for which would be the power revenues. Revenue bonds have been widely used in recent years in financing municipal ownership of utility plants. The funds for federal projects, however, in nearly all cases have been supplied by regular appropriations. But there has been a general understanding that appropriations for the construction of power plants are to be treated as advances from the Treasury, which the project is expected to repay. The clearest arrangement of this sort was at Boulder Dam where, before construction had even begun, contracts were secured which assured revenues sufficient to pay back all the appropriated funds within fifty years with interest.

No similar arrangement has preceded any of the New Deal power projects. When the T.V.A. Act was being considered by Congress in 1933, the House draft would have required the Authority to create a sinking fund which, paid into annually with compound interest, would amortize and return to the Treasury the entire cost of each dam within sixty years. Interest was also to be paid to the Treasury at the rate of 2 per cent, but only on the direct power investment at each dam. While this provision did not find its way into the final Act, congressional appropriations committees have indicated on numerous occasions that they expect repayment of the T.V.A. power investment, and Authority officials have implicitly accepted this obligation.

No definite policy has been adopted on amortization, however, When the T.V.A. power program began to earn an excess over its operating costs in 1939, the T.V.A. pointed out in its annual report that the net revenues resulting could be applied to assist in liquidating the government's investment, but no payments have been made into the Treasury for that purpose. Instead, net power revenues have been retained by the Authority, thereby effecting a proportional reduction in the amount of appropriated funds required.

In addition to the congressional appropriations it has received, totalling some two-thirds of a billion dollars through the fiscal year 1943, the T.V.A. has had limited powers to issue bonds. T.V.A. borrowings from the Treasury and the R.F.C. total $66,000,000, and were used principally for the purchase of private utility systems. The T.V.A. pays interest on the borrowed funds, but not on the appropriations it has received.

The pending Columbia Power Administration bill contains excellent provisions relating to financing.[2] By its terms the government's power investment in the Bonneville and Grand Coulee projects is to be capitalized, and the Administration is to pay interest on this investment into the Treasury annually at the going federal rate on long-term obligations. The Administration would also be required to arrange with the Treasury for amortization of the investment "within a reasonable period of years." For the purpose of acquiring private utility systems, the Administration would be authorized to issue revenue bonds which could be purchased by the Treasury or the R.F.C., and which would also be lawful investments for private investors. These bonds, guaranteed only by project revenues, differ from the general obligation bonds issued by the T.V.A.

T.V.A. bonds have been sold only to the government, and it is probable that the same practice would be followed with the proposed Columbia Power Administration bonds. It is interesting to compare such government financing with the private financing of the government-owned Central Electricity Board in Great Britain, a public corporation whose task has been somewhat similar to that of the Bonneville Administration. Funds for the construction of the C.E.B. grid system were supplied by issuance of C.E.B. stock in the investment market. The loans were secured only by the soundness of the enterprise; no government guarantee was given. Such strict adherence to commercial methods of financing has not been put into effect for federal power projects in this country, though it may well be a development of the future.

Allocation of Capital Investment

All federal hydroelectric projects are multiple-purpose in character, improving navigation or controlling floods or providing water for irrigation as well as generating power. Power and water can be sold, but navigation and flood control benefits bring in no direct monetary return to the government. The question thus arises whether power, the principal paying partner, should be saddled with the entire cost of these multiple-purpose projects. The consistent federal policy, with one major exception, has been that power should be required to pay only its own way. The exception was at Boulder Dam, where the original Boulder Canyon Project Act required power revenues to meet the entire cost of the

[2] The bill is numbered S. 2430, 77th Cong., 2d Sess. (April 1, 1942).

project, plus interest. In the Boulder Canyon Adjustment Act of 1940, however, repayment of the $25,000,000 flood control allocation was postponed until 1987, and interest was reduced from 4 to 3 per cent.

The principle that power should bear only the costs incurred for power purposes is not easy to apply, however. For it requires that the capital investment in these large multiple-purpose projects be allocated between power and non-power purposes. Certain costs are direct power costs, such as investment in a powerhouse. But a dam and reservoir represent joint costs serving several purposes, and the question as to how much of this investment is properly allocable to power can seldom be determined without using arbitrary assumptions or adopting one out of a number of possible theories of allocation.

The T.V.A. wrestled with this problem for five years before finally announcing the principles which would govern the allocation of capital investment in its projects. It adopted an "alternative justifiable expenditure" theory, based on the obvious proposition that multiple-purpose dams permit the achieving of several purposes on a more economical basis than would prevail if the same purposes were sought independently. The theory called for distribution of common costs among the purposes served by T.V.A. dams in proportion to the costs of obtaining the equivalent results by three single-purpose projects.[3] For the first three T.V.A. dams, the division of common costs was 25 per cent for flood control, 35 per cent for navigation and 40 per cent for power. When direct power costs were added to power common costs, the power investment was placed at 52 per cent of the total cost of the dams. Subsequent revisions as additional dams have been added to the T.V.A. system have changed the percentage allocations only slightly. Adding in the investment in distribution system, power is charged with 65 per cent of the total T.V.A. capital investment, according to the most recent figures.

The experience with allocation of power investment at Bonneville Dam differed widely from that of the T.V.A. The Bonneville Act of 1937 made the Federal Power Commission responsible for the allocation, which was announced early in 1938, well in advance of the formulation of rate schedules and the beginning of power sales. The Commission included interest during construction in computing total Bonneville costs, which the T.V.A. did not do, but the allocation to power was placed at only 32.5 per cent of common costs. How this figure was derived was not announced. In view of the fact that only two of the ten generators planned for were to be installed initially, the project was required to assume the burden of only one-fifth of the 32.5 per cent of common costs. The T.V.A. has always charged each power project with its full allocation of common costs as soon as it begins operation, regardless of the fact that at most powerhouses space is provided for more generators than are initially installed.

At Boulder Dam the allocation of $25,000,000 to flood control was made directly by Congress in the original statute. Ordinarily, however, allocation must be left to administrative determination, and it seems preferable for the Federal Power Commission to be charged with this responsibility rather than leaving it with the operating agency. In this way a consistent national policy could be achieved, and the power

[3] Cf., Martin Glaeser, "Those Joint TVA Costs," *Public Utilities Fortnightly* (1939), pp. 259-69.

projects would avoid the charges of fixing their power costs so as to permit cheaper power and a favorable financial showing.

Fixing Rates

Since federal power agencies are not subject to the regulatory control of the utility commissions in the states where they operate, they are free to set their own rates, with such limitations as their basic statutes may impose. The Boulder Project Act required the Secretary of the Interior to fix such rates as "will in his judgment cover all expenses of operation and maintenance" plus interest and amortization charges. The T.V.A. Act, somewhat more vague, provided that:

". . . in order, as soon as practicable, to make the power projects self-supporting and self-liquidating, the surplus power shall be sold at rates which, in the opinion of the Board, when applied to the normal capacity of the Authority's power facilities, will produce gross revenues in excess of the cost of production of said power . . ."

The Bonneville Act of 1937 specifically required the rate policy to be based on the "incidental" character of the power produced, and mentioned that amortization of the investment was to be considered a power cost. As already noted, Bonneville rates had to be approved by the Federal Power Commission.

In practice, the rates at all three projects were set up with the intention of securing revenues sufficient to cover operating costs, amortization and interest. The T.V.A. announced that, in addition, it had included a tax equivalent in its computations. At Boulder Dam the rates had to be set before construction could begin, but there were reliable estimates as to cost and power output. Falling water rather than power was sold at Boulder, generation being a responsibility of the City of Los Angeles and the Southern California Edison Company acting as agents of the United States. The rate fixed was 1.63 mills per kilowatt-hour for firm power and ½ mill for secondary power. Later, when the T.V.A. and the Bonneville projects got under way, complaints were made by the Boulder contractors that the rates fixed in 1930 were too high. Consequently, under the Adjustment Act of 1940, new contracts were negotiated reduring firm power to 1.163 mills and secondary energy to 0.34 mills. The rates may be re-adjusted at five-year intervals. Boulder contractors were required to build their own transmission lines to the dam.

Rates at the T.V.A., which unlike Boulder must cover generation and transmission costs, had to be fixed before there was any idea as to the ultimate size of the project, the amount of power available, or the effect of the promotional rates which the T.V.A. planned to inaugurate. The best estimates possible were secured, however, and subsequent experience proved the rates not far wrong. The T.V.A. sells power to municipalities and cooperatives under standard contracts covering four classes of use, and also fixes the retail rates to be charged in the resale of such power. Primary power is sold to industrial concerns and private utilities at standard rates, while rates for secondary power are based on negotiation. Rates are uniform throughout the T.V.A. system, except for an area in western Kentucky where the T.V.A. recently purchased the existing generation and transmission facilities, and which cannot be added to the T.V.A. system until Kentucky Dam is finished.

At Bonneville, rate-fixing was facilitated because the dam was almost fin-

ished, the allocation of investment to power had been made, and there was the T.V.A. experience to draw upon. Because the even flow of the Columbia River at Bonneville made the power there available continuously throughout the year, it was sold on the basis of the kilowatt-year instead of on the normal kilowatt-hour basis. The rate fixed was $17.50 per kilowatt-year, but the principle of uniformity was departed from to the extent of charging a lower rate ($14.50) within the fifteen-mile area surrounding the dam. Like the T.V.A., the Bonneville Administration fixes the resale price on power retailed by public distribution agencies. The rates are slightly lower than those set by the T.V.A. Both the T.V.A. and the Bonneville Administration have fostered public ownership by cooperating with cities, power cooperative, and public utility districts in the purchase of existing power systems.

Use of Revenues

One of the principal departures from ordinary government fiscal procedures called for in the operation of public power projects concerns the handling of revenues. Effective administration of these proprietary undertakings demands that they be permitted, or rather required, to operate with their own money, which means that revenues replace appropriations. In this way the project's pipeline to the Treasury is cut off, and the enterprise must stand on its own feet. The result is that while congressional control over the project's funds is reduced, a much more effective control is substituted.

The T.V.A. has from the beginning had the right to use its revenues in carrying on its operations, which has added greatly to its administrative flexibility. But in view of the small scale of its power business at first, and the huge expenditures required by its construction program, large congressional appropriations also were necessary. Consequently all the advantages of self-contained finance were not obtained. Since 1939, however, the T.V.A. power project has been earning net income, and after the construction stage is completed, the T.V.A. will need no appropriations. In the spring of 1942 Senator McKellar made an abortive attempt to deprive the Authority of the use of its revenues, so that it would have to secure all its funds from Congress. This is the surest way to substitute political for business management in a public power project.

The Boulder Canyon Project Act set up a special Colorado River Dam Fund, into which appropriation advances were to be paid as needed to finance the construction of the dam, and into which all revenues received under the act were also to be paid. All expenditures for the project were to be made out of this fund, but no money could be spent for operation and maintenance except from appropriations therefor. Consequently, it is necessary for Congress to appropriate each year a certain amount of the project's revenues ($750,000 in recent years) for operation and maintenance purposes. At the close of each fiscal year, excess revenues are covered into the Treasury as repayments on advances from the government.

The Bonneville Act of 1937 failed to adopt the principle of self-contained finance or a separate fund for the project, requiring instead that all revenues be covered into the Treasury. However, out of these revenues the Treasury was to maintain a continuing fund of $500,000 on which the Bonneville Administrator could write checks "to defray

emergency expenses and to insure continuous operation." This provision was intended to take care of situations where immediate expenditures were required for purposes for which Congress had not appropriated funds. It may be noted that the T.V.A. has the protection of a similar $1,000,000 fund.

The pending Columbia Power Administration bill contains ideal provisions on this point. A special fund is set up in the Treasury into which all funds of the Administration, whether from appropriations, power revenues, sale of bonds, or general receipts, would be paid. Revenues and general receipts are to be permanently appropriated to the use of the Administration, and thus would be continuously available. Moneys in the fund derived from regular appropriations would be available only for the purposes for which the money was appropriated by Congress.

Accounting and Financial Reporting

The desirability of uniform accounting methods and terminology in both the public and private power fields is obvious. Federal power agencies are required by law to adopt the standard system of accounts provided by the Federal Power Commission, insofar as it is applicable to their operations. The Commission has no powers of review or enforcement in this connection, however. The T.V.A. passes on to its contractors the obligation to use the standard system of accounts, as adapted to meet local conditions.

While the accounting systems are the same, accounting policies differ at the various federal power projects. The matter of interest during construction furnishes one example. At Boulder Dam interest during the construction period was charged and capitalized. The Federal Power Commission, in figuring the total cost of Bonneville Dam for allocation purposes, likewise charged interest during construction. The rate used was 1.54 per cent, this being the weighted average rate of interest on all money borrowed by the government during that period. The T.V.A., proceeding on the theory that its accounts should not reflect costs not actually incurred, has not charged interest during construction to the capital cost of its projects.

In the same way there has been no uniform policy with respect to interest on the investment in power facilities. At Boulder Dam, as already noted, the statute required the payment of interest. There was no such requirement for the Bonneville Administration or the T.V.A., and neither makes interest payments. However, Bonneville has taken the view that since its rates are established with a view to repaying interest on the investment as well as amortizing it, and since it desires "to keep records comparable to those of private industry", interest should be calculated and reported in its accounts as an income deduction. The rate used for this purpose is 2.4 per cent. The T.V.A. has not considered it desirable to enter hypothetical interest charges in its accounts. It does account, of course, for interest actually paid on the bonds it has issued.

The T.V.A. issues financial reports more completely commercial in character than those of any other federal power project. They include a detailed balance sheet and income and expense statements for power and the other five programs which the T.V.A. conducts. However, the Authority has been reluctant to report its power operations in terms of profit and loss, preferring to talk of *net income* or *net expense*. But since 1940 the T.V.A. has presented, in addition to its regular financial, state-

ments, a brief table in its annual report relating power income to power investment. For the fiscal year 1940 a return of 3.64 on investment was reported, and for the following year the comparable figure was 4.4 per cent.

The Bureau of Reclamation formerly gave in its annual report a statement in the form of a balance sheet for the Boulder Canyon Project, as well as a cash statement. Neither was as informative or satisfactory as the T.V.A. statements. Both were omitted from the 1941 report, which gave no financial data on the Boulder project except the power receipts. The Bonneville Administration presents simply an income statement. Although it does not own the dams or powerhouses which produce the power it markets, a balance sheet giving effect to its assets in the form of transmission lines and its liabilities in the form of congressional appropriations would seem highly desirable. Its income statement has so far been largely without value because it does not reflect the cost of the power which is marketed by the Administration.

It has been contended sometimes that for "yardstick" purposes federal power projects should issue accounting reports which would make possible comparisons between them and privately operated utilities. For this purpose it is urged that all charges which a public project escapes — interest, taxes, postage, insurance, employees' liability, etc. — be computed and shown in the project's accounts. No federal power project has issued reports on this basis (though the inclusion of hypothetical interest charges by Bonneville is a step in that direction), and there is little reason why such an attempt should be made. Any such over-all comparisons between public and private systems can have little validity. On the other hand, there is every reason why a federal power project should actually pay interest to the government, not because of any "yardstick" principle, but to re-imburse the government for the cost of the funds.

Auditing

The accounts of public power projects should be subjected to a regular annual audit by private accounting firms. Whether the accounts should also be given the regular government audit by the General Accounting Office is a more difficult problem. The Comptroller General's audit includes the power to control individual administrative transactions by refusing to approve payment, and the Accounting Office does not hesitate to substitute its judgment for that of the responsible administrators. The results of this practice are serious enough in ordinary government administration, but in the operation of a commercial power service such interference is particularly objectionable. Since the recommendations of the President's Committee on Administrative Management in 1937 for revision of the federal auditing arrangements were rejected by Congress, the best solution appears to be statutory relaxation of the General Accounting Office's control over government power projects. After eight years of struggle the T.V.A. got from Congress a compromise arrangement which preserved the right of the General Accounting Office to audit its accounts, but permitted the board to have the last word is cases of dispute.

The pending Columbia Power Administration bill contains numerous provisions intended to prevent the Comptroller General from substituting his judgment for that of the administrative officers in financial matters. One such provision is that the Secretary of

the Interior's "determination as to whether this Act authorizes particular expenditures, contracts, agreements, or arrangements of any kind or class shall be final and conclusive upon all officers of the Government." The Administrator is also authorized by the bill to compromise and settle claims for less than $1,000 resulting from the agency's activities. Ordinarily, claims may be settled only by the General Accounting Office.

Payments in lieu of Taxes

The whole problem of intergovernmental taxation is now in a period of re-examination, and it has been made more serious by various war developments. Federal power projects have enjoyed the regular federal immunity from state or local taxation, though the state of Alabama carried a case to the Supreme Court before being convinced that she could not tax the power operations at Wilson Dam. However, federal payments in lieu of taxes have been provided by Congress for federal power operations as well as in numerous other areas of federal activity. The T.V.A. Act required the Authority to pay five per cent of its gross revenues from the sale of power to the states of Alabama and Tennessee. In 1940 this formula was revised to provide for payments to all states and counties in which the T.V.A. had removed property from the tax rolls by purchase, and the amounts were increased so that the T.V.A. was paying approximately what would have been collected from a comparable private system in state and local property and business taxes. This arrangement was a practical necessity because T.V.A. purchases of land and power systems had left some local governments on the verge of bankruptcy.

In the Boulder Canyon Project Act there was likewise special consideration for the two states in which the dam was located. Arizona and Nevada were each to receive 18¾ per cent of the revenues in excess of those required for repayments to the United States. The region was also to benefit by reason of the provision that after repayments to the United States had been completed, revenues were to be retained in a separate fund to be expended within the Colorado River Basin. The Adjustment Act of 1940 removed the elements of contingency and uncertainty from these benefits by authorizing definite payments of $300,000 a year each to Arizona and Nevada, and $500,000 a year into a fund for further development of Colorado River basin projects.

The Bonneville Act of 1937 made no provision for payments in lieu of taxes. However, the pending Bone-Wallgren bill authorizes such payments on any utility properties acquired by the Power Administration from private companies. This is a device to prevent federal acquisition from damaging the financial structure of states and localities of the same character as the T.V.A. plan.

Personnel and Labor Relations

The personnel problem of the T.V.A. is scarcely comparable with that of the other two federal power agencies. Its policy of building dams by force account means that it has had to employ a large trades and labor force, now totalling over 30,000 employees, and a big engineering and construction organization. The T.V.A. must have a staff for the duties of power generation and transmission, whereas Bonneville needs only a transmission organization, and the Bureau of Reclamation requires neither for Boulder Dam.

In recognition of its special personnel problems, the T.V.A. Act of 1933 ex-

empted the Authority from civil service but required appointments and promotions to be made on the basis of "merit and efficiency." The T.V.A. proved to be so successful in adhering to the merit principle while working out a dynamic personnel program free from much of the tradition and routine of civil service, that Congress perpetuated its exemption in the Ramspeck Act of 1940, which brought all other regular federal agencies under civil service.

One of the features of the T.V.A. record of personnel management has been its enlightened handling of labor relations problems. Its labor policies were formalized in a forward-looking Employee Relationship Policy in 1935, and in 1940 it entered into a signed agreement with its organized trades and labor employees covering employment and grievance procedures, though not granting a closed shop. Organized labor has backed the Authority's plea for continued exemption from civil service, contending that collective agreements of this sort would not be possible under a civil service regime. Assuming this to be the fact, the situation could be corrected by such a statutory provision as appears in the Bone-Wallgren bill, which proposes that the Columbia Power Administration be under civil service, but adds that "the Administration is authorized to deal collectively with its employees through representatives of their own choosing and is authorized to enter into contracts with such representatives."

Conclusion

In this survey it has been possible to do little more than indicate the significant differences that have developed in the administration of our most important federal power projects. Such a comparative analysis, however, has the merit of placing the developments at each project against a broader background of experience, and permits the appraisal of the varying administrative arrangements on a sounder basis. It is particularly encouraging to note that so much of the best practice in the field has been written into the pending Columbia Power Administration bill. This is testimony to the fact that legislators and administrators have profited from the experience of the past decade with federal power, and that improved administration can be expected in the future.

Some Aspects of the Evaluation of Watershed Flood Control Projects

By BERNARD FRANK *

ONE of the knottier problems in the current flood control program of the Department of Agriculture concerns the principles, methods and significance of evaluation procedure. Far more thought has yet to be applied to one of the most complex and perplexing issues that has ever faced the federal government in its attempts to test the reasonableness and economy of its vast outlays for public works, especially in the field of natural resource conservation.[1]

It is with considerable trepidation, therefore, that the writer presents his purely personal ideas and suggestions for the evaluation of one type of federal activity — the watershed flood control survey program — with which he has had the good fortune to be associated from its inception.

Scope and Characteristics of the Flood Program

The flood control program of the Department of Agriculture was initiated under authority of the Omnibus Flood Control Act of 1936 (Public No. 738) and amendments. This act also authorizes the flood control program of the Corps of Engineers. It provides:

"that . . . Federal investigations and improvements of rivers and other waterways for flood control and allied purposes shall be under the jurisdiction of . . . the War Department . . ., and Federal investigations of *watersheds and measures for runoff and water flow retardation and soil erosion prevention* shall be under the jurisdiction of and shall be prosecuted by the Department of Agriculture, . . .".

Flood control is thus recognized by the Congress as consisting of two integral parts: control by channel improvements and control by land treatment and water conservation measures.

The scope of this Act and its amendments is indicated by the fact that practically every waterway and watershed is subject to some form of examination by the two departments directly concerned. The general pattern of activity by each is the same; namely, the conduct of "preliminary examinations" on watersheds selected from those listed under the Act and, where the results of such examination are "favorable", the conduct of "detailed surveys" to investigate, develop and evaluate the feasibility of plans for construction or "action" programs.

The preliminary examination represents the first approximation in judging the technical and economic feasibility of undertaking waterway or watershed operations. So far as Agriculture is concerned, its major purposes are to determine (1) whether a significant flood (or sediment) damage problem exists, (2) the causes of such damage, especially in relation to disturbed watershed conditions, (3) the possibilities for elimination or reduction of damage, primarily by means of runoff and waterflow retardation and erosion control measures, (4) the probable costs in comparison with the benefits likely to be produced, and (5) recommendations for or against more detailed investigations, (i.e., the

* Principal Forester, Office of Land Use Coordination, U. S. Department of Agriculture.

[1] Gilbert F. White, "The Limit of Economic Justification of Flood Protection," *The Journal of Land & Public Utility Economics*, May, 1936, pp. 133-148.

"flood control survey"). The preliminary examination, as the name implies, represents at best a quick, crude device in which the element of judgment must be given far more weight than the compilation of the data collected mainly from secondary sources.

Peculiarities of Watershed Flood Control As Affecting Evaluation Methods

The program of the Department of Agriculture seeks to accomplish reductions in flood and sediment damages primarily through the control of runoff and erosion before the water or sediment is concentrated in the larger waterways or deposited upon the flood plains; that is, *through treatment of the watershed lands themselves.* This requires the application of a relatively large number and variety of physical measures, on many types of land and under a great diversity of physical, economic, land tenure and other institutional situations. The resulting problems of developing remedial programs, of evaluating their effectiveness, and of applying and maintaining them are consequently quite complex.

Although this paper confines itself mainly to one of these problems, namely the evaluation of costs and benefits, the others bear so significantly and directly on this one that they cannot be left out of consideration. The following attempt to develop a realistic basis for applying evaluation procedures will necessarily have to take into account the characteristics and interrelationships of the several measures comprising watershed programs, and the institutional factors influencing the manner and rate of installation.

The Flood Control Act of 1936 provides only a very broad guide to the manner in which costs and benefits are to be determined: Section 1 states:

> ". . . that the Federal Government should approve or participate in the improvement of navigable waters or their tributaries, *including watersheds thereof, if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.*" (Italics supplied).

Because of this broad requirement, and in the deficiency of adequate criteria for evaluating activities of the scope represented by watershed projects, it has been necessary to adopt a rather flexible and tentative approach. Although ratios of benefits to costs have been worked out to date for a number of surveys, the policies or criteria so far developed have not been considered entirely satisfactory in meeting all of the various situations that have developed to date.[2]

The complexity of the evaluation process may be visualized by listing the more important measures for retarding runoff and waterflow and controlling soil erosion in relation to the major types of land to which they apply. (Table I).

On a given watershed, any combination of several or all of the measures or practices may need to be applied in order to achieve the desirable degree of control over storm runoff, erosion and sedimentation.

The character, stability and intent of ownership are very tangible factors affecting the design and evaluation of the program, the allocation of total costs among federal, other public, and private

[2] Appropriations under the Flood Control Act were first made in 1937; detailed surveys were initiated in July, 1938. To date, 50 surveys have been initiated, of which 20 have been reported upon. Flood control operations are now under way on one project, the Los Angeles River Watershed in southern California.

TABLE I. APPLICABLE MEASURES FOR RUNOFF RETARDATION AND SOIL EROSION CONTROL IN RELATION TO MAJOR TYPES OF LAND

Applicable Measure (without regard to priority)	Types of Land on which Work Might be Undertaken				
	Crop	Pasture	Forest and Brush	Range	Denuded
Conversion to other use (revegetation, etc.)	x	x	x	x	x
Terracing, contour plowing, strip cropping	x	x			
Planting, other revegetation		x	x	x	
Gully control or other reclamation (diversion ditches, water spreaders, slide control, other minor engineering measures)	x	x	x	x	x
Fire control			x	x	x[a]
Road erosion control	Along roads and highways adjoining all types of land				
Conservation cropping, cutting or range practices	x	x	x	x	
Supplementary engineering measures on land surface and in tributary channels.	Channel improvement, including drainage, streambank stabilization, water storage and silt detention structures.				

(a) After seeded or planted to grass, trees or shrubs.

interests, the decisions on prerequisites to the application of the program, and the administrative procedures to be utilized in installing the program and maintaining it after installation. This is indicated in part by the following classification of ownership of the land on which work must be undertaken.

Types of Ownership on which Watershed Work may be Undertaken

I. Private lands.
   - A. Farm or Ranch.
     1. Operating units.
        - a. Commercial.
          - (1) Tenant.
          - (2) Owner.
        - b. Subsistence.
        - c. Part-time.
     2. Abandoned Units.
   - B. Non-farm Forest.
     1. Industrial operating units.
     2. Speculative timberland owners.
        - a. Tax Delinquent.
        - b. Non-tax Delinquent.
     3. Other: Mineral, Power, Recreational, etc.

II. Public Lands (Federal-State-Local)
   - A. Multiple Use.
   - B. Range Use.
   - C. Park, forest, other.

Any combination of physical measures may be required on the lands in one or more of the above types of ownership. Among further complications are absentee, as against resident ownership, the incidence of the several classes of ownership in the watershed and, in the western states particularly, the problems of water rights and the resulting conflicts of irrigation as well as upland interests.

It is obvious what difficulties are likely to be met in determining how a given program is to be evaluated, into how many parts (individual measures, groups of measures, or types of land) the program should be broken down for purposes of computing cost-benefit ratios, and especially in determining the extent to which monetary considerations alone, as reflected in cost-benefit ratios, should govern decisions for or against the application of the programs.

When one stops to consider the interdependence of the various physical measures and the fact that in every situation significant and material benefits accrue that are not yet capable of spe-

cific evaluation in monetary terms; and when it is further appreciated that the present stage of hydrologic knowledge, although greatly advanced in the last decade, does not yet permit the separate calculation on an adequate basis of the effects of single remedial measures on flood stage and sediment reduction, or unchallengable estimation of the effects of treating one class of land as against another class of land within the same watershed, the problem assumes even more formidable aspects. It has taken experience to reveal deficiencies in hydrologic data and methodology under the great variations encountered in actual practice. Further research and experimentation on a much expanded scale and on many diverse types of watersheds and watershed treatments is badly needed if these deficiencies are to be fully appreciated and met, even in part.

Some Significant Limitations of Watershed Operations

As already indicated, flood stage and sediment reduction in tributary or main stream flood plains by vegetative means (or to supplement or protect large channel structures where such exist, especially in drainages having serious sediment problems), requires that remedial or preventive measures be applied to the sources of flood or silt damage on the watershed itself.

Since geology, soil, cover, drainage characteristics, kind and intensity of land use, and sometimes climate, vary so greatly over different portions of the watershed, it is necessary to design measures that will apply to the many important conditions encountered. This is only the beginning, however. The willingness and ability of the host of land owners, on whose properties the work is to be undertaken, to participate in the installation and especially in the maintenance of the various measures or treatments is obviously a factor of controlling importance in shaping the character and application of a project.

This means that unless the owners are convinced they will receive within a reasonably short time benefits commensurate with or exceeding the costs or energies they are asked to expend, their voluntary participation cannot be expected. In other words, whatever measures are applied must by and large produce not merely flood damage reduction and allied benefits downstream, but also *direct benefits to the lands upstream.*

To sum up, the "flood program" is, broadly speaking, in physical terms, a "dual-purpose" program, in economic terms, a "dual-benefits" program. The flood damage reduction aspect can no more be sorted out and dealt with independently in developing and evaluating the program than can individual measures be designed without reference to the effects of the other measures associated with them.

To What Extent Should Individual Physical Measures Be Evaluated Separately?

The interdependence of the several remedial measures and the difficulties of evaluating their individual hydrologic effects have only been touched upon. It is quite essential, therefore, that this aspect be amplified because of its direct bearing on the methods of evaluating the several types of benefits and on the significance of the ratios resulting from such evaluation.[3]

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[3] Two broad classes of benefits are recognized in Agriculture's flood program: (1) "off-site" benefits, namely those benefits accruing to the flood plains as a result of the reduction in damage from flood

(Footnote 3 continued on page 395)

There exists a pardonable tendency to break programs down into their fine parts for analytical purposes. This is understandable in view of the legislative mandate that "benefits shall be in excess of costs", and because of the worthy desire to achieve the greatest possible amount of benefits from the "flood" program per dollar expended.

Without an appreciation of the limitations inherent in financial evaluation methods—of which there are many—there is grave danger that the analyses may be carried to greater lengths, and the results given far more weight, than the character or accuracy of the basic physical and enonomic data will justify. This holds especially for the *monetary* evaluation of the effects (benefits) of physical measures. It has yet to be demonstrated that physical measures—vegetative or engineering—will individually produce the same quantitative effects as they will in combination with complementary measures.

". . . it should clearly be understood that the application of a soil and water conservation program on a given farm or unit of land is not limited to the selection of the one method of treatment which would appear to be most effective. Rather, all practical methods of control must be used in accordance with the needs and adaptability of the land.

". . . many of the advantageous effects of vegetative cover . . . may be obtained for cropland by proper planning and use of crop rotations . . .. These practices may be made even more effective by combining them with other practices . . ." [4]

(Footnote 3: Continued from page 394)

waters and/or sediment; (2) "on-site" benefits resulting from the increased productivity and returns to the people on the uplands where the work is actually undertaken. These terms will be used throughout this paper.

[4] *Influences of Vegetation and Watershed Treatments on Runoff, Silting, and Stream Flow.* A Progress Report of Research. USDA Misc. Pub. 397. July, 1940.

The above principles are made clearer by the following illustrations of their application to specific types of land.

Effects of Crop Land Measures

The measures necessary to rehabilitate or improve crop land in order to achieve flood or sediment damage reduction through runoff retardation and erosion control methods may include terracing, fertilization, cover crops, strip cropping, crop rotation, contour plowing, farm ponds and the like. Terracing by itself can readily be evaluated for its storage effects on storm runoff reduction. Yet, unless this measure is supported by the vegetative measures enumerated, the benefits so calculated may not be realized. Soil washed from the slope above and between the terraces may soon fill them up. Again, extra large sized terraces and more closely spaced than normally may be promoted as most effective in catching and storing storm waters. Yet practical managerial considerations—the excessive crop growing space taken up, the physical difficulties of utilizing farm machinery, and greatly increased costs of farm operation and terrace maintenance—may render such terracing impracticable. In short, terraces can neither be planned nor evaluated without considering *their relation to the management and economy of the operating unit as a whole.* Hence the effects of other measures and practices, such as contour cultivation, strip cropping, kinds of crops, and even the management of pasture and woodlands must be considered in estimating the need for and effectiveness of the terraces.

Forest Land Measures

For identical reasons, the planning and evaluation of range or forest land

programs require that the measures be considered in combination rather than separately.

The rehabilitation of wooded lands, or the conversion of open or denuded lands to forest cover, is a case in point. The measures required would typically include revegetation (planting of trees, shrubs, vines), control of gully erosion and establishment of more favorable soil and moisture conditions for the plantations via plowing, check dams, diversion ditches, etc., and control against fire and grazing. On sites suffering from accelerated erosion, planting alone, even if fairly successful, will in many cases not be effective enough to check further damaging soil movement except perhaps over a long period of years.

Again, revegetation and gully control measures, even in combination, will be of no effect without immediate provision for protection of the plant growth against uncontrolled grazing and fire, and without later provision against destructive cutting and logging practices. Lacking such protection, what benefits may accrue at first will start dissipating with the first fire or after a season or two of uncontrolled grazing. It is clear that the only sound basis for claiming benefits from revegetation is to provide at the same time for the protection of this measure, and to include in its cost the cost of protection.

This point will stand amplification since the principle involved bears directly on all phases of the remedial program. It will be clarified further when the processes whereby vegetation (and supplementary engineering measures) produces benefits are better understood. One of many examples is the relation of fire and fire control to the benefits produced by plant cover.

Effects of Fire Control

Fire control is *indirect* in its effect on runoff, erosion and timber or forage yields. Actual improvement of soil and water relations results *directly* from the reaction of vegetation to the site. Such improvement is brought about through root penetration, by the work and movement of soil organisms, by accumulation of litter and humus and by the shading and protection of ground cover and soil surface against the desiccating effects of sun and wind. The service performed by fire protection, however vital, is in a biologic sense, merely to insure the proper degree of development, functioning and continuity of these regenerative organic processes. Thus, if the hazard of fire were low or nonexistent, all these processes and the resulting benefits—assuming no other disruptive factors such as clearing, or destructive logging—would proceed undisturbed.

Unfortunately, very few of the forested portions of watersheds are free from the threat of fire. Therefore, to the extent local conditions require, as indicated by fire history (existence of natural and cultural fire hazards, topography, wind, moisture, and related climatic conditions favoring the spread of fire when started, among other factors) it is utterly essential that some suitable type of fire protection be provided in the formulation of such programs as apply to wooded or forested lands, whether on farm units or in non-farm tracts.

Under these circumstances, fire control is an *insurance* feature, guaranteeing that the benefits from vegetation—runoff and erosion reduction, increased yields, etc.—will accrue as estimated. As such, it is logically an integral part of the whole group of measures concerned and not a separate unrelated measure to be evaluated independently.[5]

(Footnote 5, see page 397)

Supplementary Engineering Measures

It has been demonstrated that the effectiveness of such devices as terraces (and also contour trenches, water spreaders, diversion ditches and small check dams) commonly associated with improved practices on the surface of the land, hinges entirely upon the maintenance of an adequate vegetal cover. On the other hand, it is well recognized in practice that the effective establishment of vegetal cover itself, particularly under the critical environmental conditions existing on deteriorated watershed lands, depends upon the installation of mechanical aids. These are of considerable value in holding the soil in place, and in collecting and holding water for use by plants until the roots, ground cover, and associated biologic processes have developed sufficiently to perform these functions directly.

There can be no question but that the minor types of engineering measures and the practices involved in establishing, improving and maintaining plant cover are so intimately associated and so interdependent physically as to place them in the class of joint, inseparable measures for purposes of cost-benefit comparison.

In addition to the above small-scale engineering devices on the surface of the land, flood damage reduction programs may also require the installation of larger-scale measures within or along channel courses. Channel improvement or stabilization, debris basins, the control of large gullies or arroyos and even flood or silt detention structures of some size fall in this category. Structures of these kinds are often needed to supplement the more or less limited effects of vegetation, particularly during periods of extended rainfall, or to prevent destructive movements of debris and other soil or rock materials down unstable slopes and stream channels during the time that plant growth is reestablishing itself. In contrast to a good vegetative cover, none of these structures may be considered as of permanent effectiveness, although they may be made large enough to operate with some degree of efficiency over a long period of time regardless of the rate of deterioration.

The costs and benefits of such works can undoubtedly be calculated separately even where they constitute part of the over-all program for a given watershed. It is erroneous to assume, however, that the determination of separate cost-benefit ratios for any individual structure or even for a whole group of structures in the program would furnish a sound basis for or against their justification. Merely because it is mathematically possible to make such separate calculations, it does not follow that the re-

[5] The cost of providing fire protection should be that determined to be most economical in achieving the objective sought, on the proven hypothesis that essentially unburned cover is the most effective means of reducing excessive runoff and erosion and of yielding the greatest operating returns from forest management.

Where fire control is found to be the only measure required, its effects must of necessity be evaluated separately, but here too it must be realized that even if a given woodland area now happens to be relatively free of fire injury, and is otherwise under good management, there is no guarantee that it will remain so without future provision for adequate protection and management. Changes in economic conditions or the introduction of new transportation systems may result in the sudden creation of fire hazards previously slight or lacking. In anticipation of such contingencies, estimate should be made of the damages likely to occur if no fire protection is installed (or if inadequate fire protection is continued) and this converted into future benefits to be produced by the vegetation under fire protection. Such estimate could be arrived at by comparing the present with the probable future average annual burn where current or projected developments indicate that changes in the existing fire risk are likely to occur.

sulting figures will have economic significance. A watershed is not an aggregate of independent, unrelated segments. It is a highly complex biologic entity, as truly alive and functioning as the simplest organism. No natural or man-made occurrence, disturbance or change on any one part of the watershed or drainage basin can fail directly or indirectly to affect the behavior of the balance of the area. The removal or disturbance of cover, the digging out of new channels by gullies, the aggradation or degradation of tributary and main stream channels, all have their effects on the movement of soil and on the course of water over the surface, in stream channels and in underground flowage.

Where structures are not very large, and where their main purpose is to check active erosional processes or to accumulate debris that threatens damage to flood plain properties, their temporary and limited effectiveness is obvious even to the casual observer. Ultimate control over unstable headwater flood and silt source areas can be assured only by land treatment and conservation practices. Without such control the permanent protection of downstream values cannot be achieved. Moreover, the engineering structures must themselves be protected from the operation of these identical destructive forces that made necessary their construction.

In short, these *smaller-scale structures* are justifiable only as part of the overall protective system for the basin as a whole and their benefits are dependent upon and interwoven with the benefits produced by the more permanent vegetative runoff and erosion control measures on the watershed lands above them.

Where *large structures* are concerned, and where their main purpose is to catch and hold water for prevention of damage by flood waters alone, the case for evaluation jointly with upland measures does not appear too strong on the surface. This question can best be examined by again going back to fundamentals. Basically, the only difference between the smaller, debris-catchment or soil stabilization types of structures cited previously and the larger flood water detention type is one involving length of useful life. Simply because such works, by reason of their large capacity, can by themselves delay the time when flood damages will inevitably again become a problem does not warrant the conclusion that no upstream or watershed treatments need be considered at all in the evaluation of the costs and benefits of these works.

"Flood-control programs limited to downstream installation do not provide the benefits possible in a more comprehensive attack on the problem, such as undertakes to conserve rainfall in fields, pastures and woodlands over the entire watershed. The purely engineering, downstream plan overlooks the possibilities of conserving potential flood waters for useful purposes, on the land; it fails to consider conservation of the land itself and the necessity of preventing damage to downstream flood control works by the deposition of erosional debris." [6]

Another aspect that has too often been overlooked in the past is that each engineering structure may create its own problem. The regimen of the channel below is changed and streambank cutting along the main stem and from side drainages tends to accelerate as a result of the increased cutting power of the lightly silt-laden water discharged from the dam. Furthermore, watershed conditions may alter at any time during the

[6] H. H. Bennett, *Soil Conservation.* (McGraw-Hill, 1939), p. 598.

life of the structure, causing greatly accelerated discharges of sediment into the reservoir itself.

It is evident that regardless of the size, type and number of separate structures, their cost should be treated as part of the total cost of treating a watershed, and their benefits combined with the benefits determined from the land treatment and management measures prior to the calculation of financial ratios. This means simply that the principle of mutual dependence can no more be ignored where large structures are required than in situations where vegetative and minor engineering measures are sufficient.

To What Extent Should the Remedial Program be Divided Among Ownership Classes for Purposes of Separate Evaluation?

Current attempts to evaluate separately the sub-programs or groups of measures relating to the respective broad ownership classes, (e.g., private farm, private non-farm, public) in a watershed are intended to determine for each class whether or not a program is justifiable.[7] Thus, for example, if the final cost-benefit ratio for a program on non-farm lands was found to be adverse, but the ratio for the program on farm lands was computed as favorable, no program involving the use of federal flood control funds would be recommended for the non-farm lands. Situations such as the following might develop in a watershed where the total over-all ratio was favorable:

[7] The practice of calculating cost-benefit ratios for the major subwatershed units of a given watershed as well as for the watershed as a whole is recognized as a sound and desirable approach. The question here concerns the feasibility of further breaking down a subwatershed unit into several parts for evaluation purposes.

NONSUCH RIVER WATERSHED

Drainage Unit of Evaluation	Cost-Benefit Ratio		All Lands
	Non-Farm Land	*Farm Land*	
Subwatershed A	Favorable	Favorable	F
" B	Unfavorable	Unfavorable	U
" C	Favorable	Favorable	F
" D	Unfavorable	Favorable	F
Total Ratio			F

In the situation above, no operations in aid of flood control would be recommended on subwatershed B, since the overall ratio was unfavorable. (This assumes, of course, that full account has been taken of the contribution of a program on this and the other subwatersheds to the reduction of damages in the flood plain of the main watershed.) In subwatersheds A and C work would be scheduled on all lands, but in D, only on farm lands. Closer analysis of such conclusions will reveal serious weaknesses in the basic premises.

First, let us examine the components of the cost-benefits ratio. The benefits side is made up of two main parts: "on-site" and "off-site". Referring to watershed D, for example, it may be found that for each dollar of total expenditure (public and private combined) greater off-site benefits may be realized from the non-farm than from the farm land program. But because of the denuded or deteriorated condition of the non-farm lands, evidenced by almost complete loss of top soil, bad gullying, and badly depleted growing stock, ground cover, litter and humus, the usually evaluable on-site benefits (increased net income) may be so long in accruing that, when discounted to the present, their value may well-nigh be negligible. Whereas in the case of the farm land category, the better condition of the area and conse

quently the earlier maturation of benefits (e. g., increased crop yields) may still remain large enough when discounted to the present to more than offset their proportionately lower contribution to off-site benefits.[8] This indeed, may often be the case.[9] Yet according to the major purpose of the program, namely flood damage reduction, the work on non-farm lands would presumably be of higher priority.

Flood-Control vs. Over-All Cost Benefit Ratios

Such a situation might conceivably lead to the observation that the economic feasibility of the program should be determined rather on the basis of the ratio of flood control (i.e., in practice, federal) costs to off-site or flood control benefits.

There is no question but that granting the broad limits of error necessarily encountered in the present stage of the science of hydrology, it is possible to estimate the effects of combinations of specific physical measures on flood stage and sediment reductions. The determination of what share of the total cost of installing and maintaining the program should be charged against such benefits is quite a different matter. From the previous discussion on the evaluation of physical measures, it is submitted that the only defensible way *technically* of ascribing to the total cost of each physical measure (singly or combined) that portion which should be borne out of flood control funds, and that portion which should be borne out of other funds, is on the basis of the proportion of flood benefits to total benefits. Thus, if the total cost of a program were $1,000,000, and the total benefits $3,000,000, of which $500,000 were off-site, the charge to flood control funds would be one-sixth of $1,000,000, or $166,666.[10]

Admittedly, this relatively simple method, however sound technically, is not always applicable in practice. On privately-owned areas still in fairly productive condition, as in the case of the more prosperous commercial farm units, sufficient benefits may be realized in a short time to permit the owners, entirely on the basis of their direct interests, to bear the major share of the cost of the program. On poorer lands, however — submarginal farms, tax delinquent lands, abandoned lands, and depleted or less productive forest areas, often constituting the worst flood and sediment sources — the returns to the owners may be so meagre or so long deferred as to make it impossible or extremely unlikely that they can ever see their way clear to cooperating in the program. Such areas, recognized as uneconomic for continued private ownership and constituting threats to the living standards and social stability of the region, are generally considered fields for purchase and development in the public interest, whether for ultimate reorganization of their economy and resale to private agricultural enterprise or for permanent retention by the public. Under such circumstances, if flood damage re-

[8] The cost of treating a unit of farm land for example, is $5. Total benefits are $9, of which $8 are on-site and $1 off-site. The cost of treating a unit of non-farm lnd is $4. Total benefits are $3, of which 50 cents are on-site and $2.50 off-site.

[9] It is conceivable that when the total flood damage reduction benefits from a program limited to one class of land in a given subwatershed unit (in this instance, farm land) are cast up, their total amount, or the amount per square mile of watershed area may then be so small as to make highly questionable the initiation of any flood program at all.

[10] Public policy considerations, dictated by special social or economic circumstances, might justify a larger contribution out of federal flood control funds, to an upper limit of $500,000.

duction benefits are to be derived at all, public acquisition must precede installation and maintenance and the costs of the program increased accordingly.

In situations of this kind, it would seem logical to compare *public* costs with *public* benefits *as a whole,* rather than with off-site benefits only. Similarly, where work is to be undertaken on lands already in public ownership, *all* benefits derived—the on-site as well as the off-site benefits—would be public and hence comparable with the total cost of the program.[11]

The application of this approach would in nowise affect the present practice of classifying net returns to owners and operators of private lands as private, on-site benefits.

Applying the above reasoning to the illustration previously cited would produce the results indicated in the tabulation below.

In this illustration, no work would be undertaken out of flood control [12] funds on Watershed B, but work would be undertaken on the lands now in or suited to public ownership in Watersheds A, C and D. In the case of the private lands in A and C, where the ratios of public cost to off-site benefits are adverse, but where the over-all ratios are *Favorable,* the amount of public funds to be expended might be based either on the proportion of flood damage reduction benefits to total benefits, as the lower limit, or up to the total amount of flood damage reduction benefits as the maximum, provided, of course, that the ben-

Unit of Evaluation	Cost-Benefit Ratios		
	Ratio of All Public Costs to All Public Benefits *Public Lands* (Existing and to be Acquired)	Ratio of Public Costs to Off-site Benefits *Private Lands*	Ratio of All Costs to All Benefits *All Lands*
Subwatershed A	F	U	Favorable
" B	U	U	Unfavorable
" C	F	F	Favorable
" D	F	U	Favorable

[11] The current emphasis on flood damage reduction benefits as the primary basis for justifying watershed projects under the Flood Control Act may be attributable in part: (a) to the uncertain language of the Act itself; (b) to the fact that other acts under which the Department of Agriculture operates already permit the conduct of watershed programs of similar nature. In the writer's opinion, the distinctive feature of the Flood Control Act is that it *requires,* rather than permits the prosecution of projects on *a unified watershed basis.* There is nothing in the Act itself which can be interpreted to compel either the War Department or the Department of Agriculture to justify waterway or watershed projects solely on grounds of flood reduction benefits. The Corps of Engineers of the War Department has consistently taken other values into account — navigation, power, pollution, water conservation, etc., whenever these were found to exist — and has determined the economic feasibility of its projects on the basis of the ratio between the sum of the combined benefits attainable and the total federal cost.

[12] The distinction between "flood control" funds and "federal" funds appears to the writer to be merely a matter of current budgetary practice, the source of funds being the same regardless of whether funds for "flood" programs on public lands come out of federal flood control appropriations entirely, or in part out of such funds and in part out of other federal appropriations such as Title III of the Bankhead-Jones Farm Tenant Act, the Week's Law, etc.

efits to the private owners involved, as indicated by the favorable over-all ratios in each of the three sub-watersheds, were sufficient to induce them to furnish the balance of the total cost of the program. In the event that private owners, despite a clear showing of reasonably early direct net benefits over the costs they were asked to incur, were still not willing to meet such costs, then no recommendation would be made for the expenditure of federal funds for work on their lands on a voluntary cooperation basis.

Actually, on by far the majority of operating farm enterprises, the costs to be incurred represent very largely *not* cash outlays but labor input – often otherwise unused – and "home found" materials often possessing little or no sales value. It is fairly reasonable to assume, therefore, that where benefits in excess of costs are substantial and not too long deferred, private contributions will usually be forthcoming from the majority of owners.

Significance of Program Evaluation by Ownership Classes

For the sake of simplicity, the above discussion has assumed that it is technically feasible to evaluate separately the effects of remedial programs by classes of ownership (a) on income; and (b) on flood stage and sediment reduction. This assumption needs especially critical analysis. Upon its validity depends the significance of the cost-benefit ratio for each class of land as a whole and the extent and manner of application of the program on a given watershed unit.

Evaluation of on-site benefits. The nature of these benefits is such that no particular technical difficulties are encountered in determining their physical magnitude and so giving them monetary expression. This is because the on-site benefits, as the term implies, accrue directly to *specific* tracts of land. Thus, the construction of terraces and the introduction of contour plowing and strip cropping on a given field produce direct benefits to that field by way of greater yields and increased net income. On-site benefits for the total area of a given class of land—farm or non-farm—can then be calculated by multiplying average or unit-per-acre values by the total acreage involved. Total costs are likewise directly determinable, thus providing the necessary elements of the "on-site" portion of the cost-benefit ratio.[13]

So far then, the assumption holds. The derivation of off-site benefits will now be examined.

Evaluation of off-site benefits. In evaluating a remedial program for floodwater damage reduction, it is necessary first, to express the effects of the several measures in units of surface runoff reduction (e.g., increased infiltration); second, to express this reduction in terms of peak or flood flow (at a given reference point, i.e., a stream gage); and third, to translate this new discharge rate into terms of flood stage and area inundated. These stages are then compared with the stages occurring without a program being in effect.

The last step requires field determination of the area inundated by flood flows produced by given types of storms; in other words, the areas respectively subject to damage at each of a number of selected flood stages. It is likewise essential, particularly where crop lands and urban and industrial properties and services are concerned, to determine the

[13] The effects on general community benefits, such as increased purchasing power, or the reduction in costs achieved by undertaking programs for groups of farms or for a unit area as a whole, are not taken into account in this discussion.

periods of inundation associated with given flood stages since the respective duration of these stages as well as the height of the water above the surface determines the amount of damage.

The above processes cannot be generalized safely, but should preferably be related directly to storms of record whose intensities, durations, or both, were such as to have produced flood flows.

In effect, by applying the above or other suitable methods, the hydrologist is able to state that if the remedial program had been installed when a given flood of record occurred, the area inundated would have been lesser by a certain acreage than that actually inundated, and the values subject to damage correspondingly lower.[14]

With these data provided, it is then possible to calculate the amount of damages by selected inundation periods for selected flood stages, taking into account the incidence and extent of each class of land, kinds of crops, improvements, etc., occurring on the flood plain, and season of flood occurrence. By applying unit prices to the values concerned, the difference in amount of damage before and after the program, when recalculated on the average annual basis, represents the expected benefits, given the same frequency and distribution of storms as existed in the past.

When the hydrologist establishes his estimates of the physical effects of a program, he must necessarily think in terms of complete drainage units. True, in order to compute the reduced runoff, he must be given data showing the types of measures proposed, the acreage to which each measure, or group of measures applies, and the acreage of each important combination of soil, cover and condition (the "soil-cover complex"). But once the respective runoff reduction factors are computed, (e.g., in terms of percentage of total runoff as determined by hydrographs prepared from stream gage records) the balance of the computations must for practical reasons be entirely in terms of the drainage area as a whole. This is because at the present stage of hydrologic knowledge, it is not possible to say, even with a slight degree of precision, that for watersheds of any considerable size, say 100 square miles or larger, a given reduction in runoff from a given fraction or fractions of the drainage area will produce a corresponding reduction in flood stage, or even in flood volume. If a direct relation of this kind did exist, it would then be simple to assign to each acre treated a share of the total reduction in flood damages. But no such simple correlation exists, and for obvious physical reasons.

The contribution of a given amount of surface runoff to stream channel flow depends, among many other complex factors, on the time it takes for a given flow spread out over the surface of ground to reach the stream channel. To put it very simply, runoff from the uppermost part of a watershed, other factors assumed equal, will take longer to reach the main channel or flood plain than will runoff from land located nearer thereto.

Surface slope gradients and other hydraulic characteristics of minor stream channels, underground drainage conditions, the shape of tributary drainage areas, the depth and condition of soil and its plant cover, and rainfall characteristics, particularly with reference to the shifting location of storms of given intensities and durations over the watershed, are other complicating factors that

[14] Similarly, by use of appropriate methods, the effects of a program on sediment-damage reduction are determined by comparing sedimentation rates with and without a program in effect.

for practical reasons have so far precluded expenditures of time and money that would be required to give proper weight to the runoff factor. Yet without considerable research the allocation of flood reduction benefits to specific portions of a drainage basin must remain a matter of sheer judgment.[15]

Unless, therefore, the several classes of land for which it is desired to prepare separate evaluations happen to form complete drainage units as well, the contribution made by each class to the sum total of the off-site benefits from the watershed unit as a whole is not now determinable by any objective scientific standards.

It can be argued that by applying runoff co-efficients and proportion of total area which each co-efficient represents as one basis, the proportionate effects might reasonably be estimated. Essentially such a proposal has been advanced, but even here the final interpretation is made in terms of watershed units.[16]

Still another difficulty exists in the attempts made to evaluate hydrologically the effects of programs covering only portions of complete watershed units. This is best brought out by the following illustration:

Assume a watershed represented by two major land classes: farm and non-farm, neither class occupying a complete drainage unit. The individual properties comprising each class are not contiguous, but more or less scattered or grouped across drainage lines. Suppose it is estimated by a method of runoff apportionment that the contribution to flood damage reduction benefits of the projected program for the farm lands is 60 per cent of the total of flood damage reduction benefits. (Such estimates have been presented on the premise—in accordance with the unit-hydrograph principle[17] – that a given reduction in runoff will produce a corresponding reduction in peak-flow, and on the basis of evidence that a direct relation existed between flood discharge and flood damages.)

Prerequisite to any estimation, however, some assumption needs to be made regarding the amount of runoff to be expected *in the future* from that class of land constituting the balance of the watershed area, which is not yet being evaluated (i.e., held as a constant in the calculations of main stream flood reduction to be derived from a program on the other class).[18] One of three alternate assumptions could be made: (a) that *even if no program is undertaken* the non-farm land will remain in its *present* condition; (b) that its condition will become worse without a *program;* or (c) that a program will be undertaken. In (a), present runoff factors would be applied to the calculations of the off-site effects of the farm program; in (b), new runoff factors would have to be com-

[15] Merrill Bernard: "Giving Areal Significance to Hydrologic Research on Small Areas. Headwaters Control and Use." Chap. III. *Upstream Engineering Conference.* 1936. U. S. Gov't. Printing Office, Washington, April, 1937.

[16] *Ibid.*

[17] The unit hydrograph principle is that the distribution of surface runoff from storms of unit duration is constant and that the discharges vary with the intensity of precipitation. For example, if the unit hydrograph shows that 10 per cent of the total runoff occurs during the first six-hour period, the same per cent will occur during the same time from a storm of unit duration, regardless of the volume of rainfall.

[18] For purposes of this discussion, it is taken for granted that both the farm and the non-farm classes, in whole or in part, represent flood (or sediment) source areas and as such require attention in the development of the remedial program. Such areas as are now in good condition and under stable, permanent management would of course not be recommended for treatment and are therefore not considered here.

puted based on forecasts of the character and extent of future soil-cover complexes, and in (c), reduced runoff factors based on the improved condition would be applied.

The estimate of 60 per cent flood reduction benefits can of course be made only under one of the assmptions outlined above.

Suppose assumption (a) to be selected. Considering the type of land problems which are encountered in watersheds meeting the necessary requirements for the undertaking of flood control surveys (i.e., downstream damages traceable to unsatisfactory watershed conditions) there is poor prospect that a given class of land, which has deteriorated in the past, and is now continuing to deteriorate, will remain in its present condition *without a program*. Instead, as experience dictates, it is more than likely that *unless* remedial measures are applied, the harmful effects of progressive land deterioration will offset, if not negate entirely, the flood damage reduction benefits claimed for the remedial measures on the other class of land. On this point, the United States Forest Service, in its recent report to the Joint Congressional Committee on Forestry expresses great concern.

"The United States is embarking on a flood control program on a national scale. How can supplemental expenditures for upstream engineering be justified without assurance that the forests on which most of them will depend for their value, will be protected? The same question can be asked for the nation-wide erosion control program and for reclamation projects now under way in the West. The same question also holds for water power because of its growing importance for national defense and because of its dependence upon the condition of watersheds in which forests should play an important part." [19]

This leads to consideration of assumption (b). By field investigation and by analysis of trends in land use and their effects on soil and cover depletion, it is possible to provide the hydrologist with data on future soil-cover complexes to which he can then apply the appropriate runoff factors. By comparison with assumption (a), this is submitted as by far the more realistic approach; though it, too, is subject to the fundamental limitations of the method as a whole. The results of this analysis may (of course) indicate that runoff may increase so greatly in the future as to offset whatever benefits are derived from the program on the other class of land.

There remains the third choice: to reestimate the effects of the farm land program on the assumption (c), that a program will also be undertaken at the same time on the non-farm lands. When this assumption is made, however, the necessity for separate evaluation of the off-site benefits from each class of land is no longer apparent.

A more justifiable alternative to any of the above possibilities might involve the further subdivision of each subwatershed unit into its tributary components. In this way the validity of the hydrologic concept would be maintained. One drawback would be the increase in the cost of investigations, though the far greater accuracy of the results might fully warrant it. Another would be the difficulty of tracing the effects of each small watershed on the flow of flood waters in the stream channels of the main watershed.

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[19] Summary of recommendations presented by the Forest Service to the Joint Congressional Committee on Forestry with respect to a forest program for the United States. (Revised June 5, 1940.)

Effects of Partial Application of Programs

The foregoing discussion has assumed the application of programs to the entire area of each class of land under consideration. In actual practice it will rarely be possible to obtain 100 per cent application on lands in need of treatment, especially where private ownership exists. Hence the benefits both off-site and on-site—calculated on the basis of a full program must be scaled down accordingly. As already indicated, no satisfactory method has yet been developed for determining what that reduction should be, even if the forecast of the extent and incidence of future participation by land owners were accurate. One approach would be to apply assumption (b) as regards the non-cooperating lands, plus the exercise of a considerable degree of judgment, as the basis for an estimate. Another method, already used in several cases, would be to assume arbitrarily that the off-site effects of a program on portions of a watershed are directly proportional to the acreage of land recommended for treatment. This method, applied without reference to specific local variations in physical factors, is submitted as being hardly in accord with the principles underlying the science of hydrology. Nevertheless, until some more satisfactory means can be developed, practical considerations favor the method of proportionality.

Should Monetary Considerations Be the Sole Criterion for Determining the Economic Justification of Flood Programs?

The cost-benefit ratio at best is admittedly a crude criterion for determining the justification of a flood control program. One of its greatest deficiencies is that it does not take cognizance of those outstanding physical or social situations which, as Congress and the Supreme Court have recognized in many comparable instances, may justify an operations program where an unfavorable ratio based exclusively upon a monetary evaluation might indicate otherwise. This problem and suggestions for meeting it are taken up later.

But, ignoring even this very real problem for the moment, the determination even of the direct monetary benefits—not to mention costs—is fraught with possibilities for error of the greatest magnitude. This is forcibly expressed in the results obtained by comparing cost-benefits ratios computed by employing different sets of price indices and indices of costs of labor, materials and equipment. Thus, price indices based on a 10-year period may yield entirely different results from those based on a 5-year or 25-year period, respectively. The practice of using *current* values and wages to express material and labor costs, and periodic price indices to express benefits, hardly lends itself to just comparison of costs and benefits. Costs are equally subject to the fluctuation of the business cycle and therefore should be calculated accordingly.

The choice of interest rate employed to discount actual costs and benefits to the present in order to provide a common basis for ratio determination is another problem that has not been thought through sufficiently. With one rate, a highly favorable program may be computed; with another, the ratio may be adverse. Nor are all deferred costs necessarily interest bearing, as for example, family labor that is expended on farm improvement not otherwise employable at wages. It may also seriously be questioned whether benefits of a public nature accruing at some time in the future should even be discounted at all. Future

benefits of a permanent nature, making possible a higher standard of living within the next generation, may be just as important to society at large as benefits accruing in the present.

Another way of recognizing this public interest in future benefits might be to calculate the increased costs of rehabilitating land and people if the resources of a given watershed are allowed to degrade and to take this into account in the cost-benefit comparison process.

It does not follow that all attempts to compute cost-benefit ratios should be tossed overboard. But the above does suggest that other considerations besides the cost-benefit ratio itself should be given weight in determining whether or not resource conservation programs on a given watershed unit are justifiable.

Clark, in his analysis of the economic effects of public works, makes one of the clearest statements bearing on this point:

"There is no universal formula for measuring or otherwise determining the precise value of public works, or even their precise order of value, relative to each other. Different processes have to be used, according to the nature of the works in question. In some cases where the works render a definite economic service as a means of protection, their economic value can be estimated in money terms. Where possible, this should be done. But in many cases, it is not possible, and even where it is possible, there are likely to be complicating elements of a sort that defy precise measurement. The values concerned include . . . conservation of natural resources for future generations, ...

"Thus it appears that there are fairly calculable values, and others as to which the only test is the test of how much an enlightened public is willing to pay when the issue is put before it as clearly as plans and statistics will permit. . .

"On the cost side, a special consideration arises when the carrying out of public works is undertaken as a means of putting otherwise unemployed resources to work and getting something out of them in place of nothing. Here the fiscal cost of the work has to be balanced against the social cost of idleness, or at least against the fiscal burdens of public relief which would have to be borne in one way or another if employment were not afforded.

"If the public expenditure involves secondary effects — as it normally does — resulting in increased incomes for members of the community over and above the amount of the Government expenditure, this is a further offset to the cost." [20]

Clark recognizes three classes of benefits created by public works: *primary direct* benefits resulting from wages earned on the job itself; *indirect primary* benefits, resulting from the employment required to produce the necessary materials and to deliver them to the construction site; and *secondary benefits*, resulting from the expenditures of all those among whom the original public outlays are divided as income — this includes wage earners and receivers of rent, interest and profits.

In discussing the appraisal of primary indirect benefits, Clark asserts that,

"as a rough rule of thumb it may be laid down that, under ordinary working conditions, the amount of indirect primary employment is about equal to the amount of direct primary employment. However, where the volume of direct employment is deliberately swollen by reducing the amount of machinery, the ratio would no longer hold and the volume of indirect employment would naturally be less than the direct employment."

The secondary employment benefits he finds much more difficult to estimate and leaves to the best exercise of judgment and caution to determine. He observes also that these effects fade rapidly out of the picture as the original public

[20] John Maurice Clark, *Economics of Planning Public Works*. A study made for the National Planning Board of the Federal Emergency Administration of Public Works. U. S. Government Printing Office, 1935.

expenditures are consummated. Nevertheless, he contends that such effects do exist and may indeed be considerable; and he cites an example in support of this thesis.

As applied to conservation programs, e.g., the type represented by watershed treatment in aid of flood control, the secondary effects undoubtedly deserve far more attention and considerably greater effort at estimation than has yet been attempted. The need for such emphasis is ably brought out in the literature on various phases of conservation. To give only one citation from one of the more recent works, Lorimer[21] in discussing the population problem in the South, points out that "the first step, to guard against further reduction of already low economic returns, is to see that natural resources are not further dissipated." . . . and further, that "under wise use and careful conservation there is little danger that resources will act as a check on population growth but the destitution resulting from exploitation and abandonment of developments must be reduced to a minimum." To the influence of technology on the destructive exploitation of natural resources he gives due weight as well as to the discovery and efficient utilization of technological processes. The technology of conservation—as exemplified by the installation and especially the maintenance of watershed improvement measures — should, to use Lorimer's words, "profoundly affect the ratio of resources to population", especially in the depleted areas most in need of such measures.

This identical thought is expressed by Benton MacKaye:[22]

" 'Land', in its broad sense, is the ultimate source of all employment. . ..

"The immediate use of these resources constitutes the extractive or primary industries . . . which are the basis of manufacturing and the other secondary industries; the latter cannot long develop ahead of the former, . . . This makes for waste of material and uncertainty of employment, as well as financial failure. New opportunities for employment, therefore, should be sought as far as possible in the primary rather than in the secondary industries — *in the initial development of the land and the land's resources. . .." (Italics supplied.)*

"This could be done by offering alternative employment in a comprehensive construction program for developing, without industrial obstructions, the country's natural resources. By no one single stroke, perhaps, could more be done to stimulate wholesome labor standards in American industry, or so reduce living costs, than an extensive and effective application of such a policy."

Studies of the effects of recreational expenditures on employment and income in regions of scenic attractiveness — in many cases the very regions constituting critical land use and flood problem areas — also bear out the need for including the "secondary" effects along with the primary, in evaluating the benefits of watershed improvement programs.

Thus an analysis made of a recreational county in Wisconsin indicates that at least 42 per cent of the expenditure by tourists and vacationists are in the immediate locality.

"It has been estimated by the Agricultural Industries Department of the Tennessee Valley Authority that many counties of the Southern Highlands Region have an annual cash deficit of five to eight dollars per capita, which is made up by borrowing or by subsidies from State or Federal Governments. In some counties it is estimated that depletion of soil and forest crops increases the deficit (approximately $17 per capita in Grainger Co.)"[23] *(See page 409.)*

[21] Lorimer, Winston & Kiser: *Foundations of American Population Policy.* (Harper: 1940.)

[22] Benton MacKaye: "Employment and Natural Resources," *Department of Labor, Office of the Secretary.* Gov't Printing Office, Washington: 1919.

In view of the foregoing, to restrict the evaluation of benefits from watershed flood control programs to *direct* income returns is, as Ogilvie points out, ". . . not merely unscientific in theory: it increasingly does injustice to the facts of the modern world." [24]

When the benefit elements are so narrowly interpreted, the cost-benefits ratio becomes in effect a mere bookkeeping device, applicable perhaps to the conduct of private profit-making enterprise, but entirely inadequate as an expression of the purposes and far reaching economic effects of public works programs. When such a device is used, as under ordinary methods of calculating directly visible and easily evaluable benefits only, the equally, if not more important benefits – those that inevitably arise from the improvement and more efficient utilization of the soil, water and cover resources of the nation – are ignored entirely. Such failure even to estimate the extent of these benefits has aptly been characterized as placing a "zero" value upon them.

When one considers the effects of land and water misuse on unemployment, on lowered farm income and public revenues, and on decreased effective demand for the goods and services needed to maintain adequate living standards, there is no reason why any program that reduces such serious social and economic hazards by restoring the productivity of the land should not confidently claim benefits accordingly.

[23] *Recreational Development of the Southern Highlands Regions,* A Study of the Use and Control of Scenic and Recreational Resources. TVA Department of Regional Planning Studies, February, 1938.

[24] F. W. Ogilvie: *The Tourist Movement: an Economic Study.* London, P. S. King, 1933. Cited in the previous reference.

Estimation of "Unevaluable" Benefits

As Clark wisely insists, every reasonable attempt should be made to estimate these "intangible" values in monetary terms. One method might be through the medium of case studies in areas selected as representative of the types of problems the flood program is designed to ameliorate.[25] Thus, in areas becoming or already decadent primarily because of natural resource depletion, such indices as decreased employment opportunities, forced migration, increased tax delinquency, declines in acreages of productive lands, and especially in values of farm and forest lands and improvements, and declines in volume of trade, should provide reasonably valid bases for estimating the additional benefits from upland flood control programs. Such findings would apply just as much to the effects of measures undertaken on private lands as to those which are applied on public lands.

Where for one reason or another it is not feasible to make case studies of the above type, or to apply some adequate method for expressing in monetary terms the economic effects of trends on given watershed survey projects, it might then be permissable to apply some such rule of thumb method, as Clark indicates, than to make no estimate at all. It is believed and here suggested that under these specific circumstances, and with due regard to the sustained, long-time effects of such programs, a ratio of $1 of

[25] Gilbert F. White, "The Limit of Economic Justification of Flood Protection," *The Journal of Land & Public Utility Economics,* May, 1936, pp. 133-148. White suggests intensive studies "in a few diverse and representative areas and in a fashion to devise a scale by which general benefits might be related to special benefits as the basis of the amount of economic activity in the area receiving special benefits." He submits that while such a scale would not be perfect, nevertheless it would represent a smaller margin of error than personal opinion alone.

primary indirect and secondary benefits combined be applied to each $1 of primary direct benefits, or in other words, that total benefits be considered as twice the amount of evaluable direct benefits. In this case, the primary direct benefits would be the *income increases resulting from expenditures of public and private funds combined* rather than the amount of direct public expenditure only.[26]

Selective Justification of Watershed Projects

The above proposal and the discussion preceding it may produce the criticism that it would then easily become possible to justify the expenditure of vast sums of public money for any and all types of measures and activities deemed to bear even in the remotest way on the flood problem.

This does not necessarily follow. In the first place, regardless of the availability of federal funds, only those watersheds need be considered in which the flood problem is of sufficient magnitude, and the contribution of a watershed program to its amelioration is significant enough to warrant the investment of public flood control funds. By this criterion, a number of watersheds would be deferred as flood projects *per se*, either in the preliminary examination stage of, or during, or subsequent to the conduct of the more detailed survey investigations.

Second, out of the list of watersheds thus meeting the above requirements, only those that exhibited relatively the most critical flood problems in terms of damage, loss of life, or threat to social security, and indicated the most favorable opportunities for public investment primarily in the public interest, would be selected for immediate attention.

Third, the unit costs set up for each of the respective measures would have to be of tested reasonableness, as indicated by comparison with the costs of similar measures already installed elsewhere or on the watershed itself, by scrutiny of the individual elements composing the total unit cost of each measure, and by preparation and evaluation of alternate plans of improvement of varying intensity and effectiveness.

An additional safeguard to the federal interest in prosecuting watershed flood programs would be to charge private beneficiaries with the maximum possible share of the total cost by virtue of the amount of direct primary benefits received (increased income) rather than on the basis of the proportion of private to total benefits.[27]

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[26] Whereas public construction works produce no direct income of themselves and provide direct benefits only by way of employment, in the case of conservation projects the direct benefit is the income resulting from the use of the land and its resources under conditions of enhanced productivity.

[27] Nevertheless, this will be influenced by considerations of the public interest. These are succinctly summed up by Ely & Wehrwein. "Inasmuch as the private owner performs a function which is of public as well as private benefit in conserving the natural resource in his possession, there is ground for, if not an obligation upon the public, the sharing of the costs of conservation with the owner. This precept varies with the resource, and before it is applied the public benefit must be clearly established.

"How far the public is willing to go in sharing costs with the private owner is an unanswered question. However, Ciriacy Wantrup warns: 'Thus a society might very well be justified in investing efforts for conservation of land under conditions where interest rates and expected future returns would make it impossible for individuals to do so. But society should be perfectly clear and honest about the costs to the community. The true interest rate should always be used in computing these costs. In other words, social costs – for example interest charges – cannot and should not always determine social actions . . . but they should always be thoroughly explored and taken into account by those who make or approve Government decisions . . .'". R. T. Ely and G. S. Wehrwein. *Land Economics*. (N. Y. Macmillan: 1940.)

Some Tentative Conclusions

As a fundamental principle, it may be stated that "runoff and waterflow retardation and erosion prevention in aid of flood control" can best be achieved by means of vegetative measures applied in the form of *unified land use programs over the watershed unit as a whole.* Land management practices, fire control and minor engineering measures needed to facilitate the successful establishment of vegetation and to maintain its protective and productive functions, are an integral part of such treatment and no separate cost-benefit ratio should be assumed.

Larger engineering works or measures such as channel stabilization, silt or debris detention basins, flood storage dams, etc., when deemed necessary adjuncts to the vegetative or land treatment program should be evaluated jointly with the land program as an inseparable part thereof.

As in the case of the vegetative measures, it will be desirable to consider alternate plans in order to make sure that the most economical combination is developed. After this is done, however, cost and benefits should be determined for the program as a whole within the watershed unit in question.

Where large structures are already installed, and where their operating efficiency or length of life is threatened by erosion and sedimentation, watershed measures are fully justified. This is on the basis of benefits to the structures themselves and to the downstream values protected by them. In evaluating the off-site benefits from watershed treatment, the cost of maintaining these structures *permanently at full operating efficiency* should be among the factors considered. Permanency of operation is here interpreted to include provision for replacement of structures where alternate sites are available, regardless of the period of amortization employed for investment calculation purposes.

Where no other means are available for estimating the primary indirect or secondary benefits from watershed programs, they may conservatively be given equal weight with the primary direct benefits in determining the economic feasibility of watershed flood programs, particularly where public holdings or areas presenting serious social and economic problems are found to exist.

The watershed program is a dual-purpose program. The same measures produce both on-site and off-site benefits accruing both to individuals and to society at large. It is therefore submitted that the over-all relation of benefits to costs is more significant and more in the public interest as an indication of economic feasibility than the relation of flood reduction benefits to federal costs.

Monetary evaluation procedure can express only in part the values at stake in the development of watershed projects. Priorities among programs cannot and should not be determined solely on financial grounds. Threats to community life and security arising out of the rapid dissipation of watershed values, and the national need for conserving resources for future use are among the other factors to be carefully weighted in the selection process. The relations of man to man growing out of the use and ownership of natural resources can neither be formalized nor subdivided into convenient compartments. The men of economics, hydrology and other fields can contribute effectively to the development of an adequate evaluation procedure only by recognizing the socio-biological aspects of the watershed problem and adjusting their thinking thereto.

Urban Redevelopment Corporations

By ARTHUR C. HOLDEN *

THE writer has been an advocate of urban redevelopment for twenty years and has coupled that advocacy with insistence upon group planning and group procedure, plus emphasis upon the need for the reorganization of long-term realty finance. Recently urban redevelopment has become sufficiently popular to attract many to its bandwagon. While it is always encouraging to gain recruits, there is reason for grave concern at the present time. Even the most intelligent newcomers are insisting upon using instruments that are so full of appeal that a new public is attracted which follows those particular instruments, unaware that harmony of procedure requires a nice balancing of many instruments, with proper and varying emphasis given to each.

I

The instrument that is heard above the orchestra at the present time is the proposal for a huge federal subsidy to buy up the real estate of blighted areas. This instrument is being played by Guy Greer and Alvin W. Hansen. They are not the first to advocate a subsidy for rebuilding blighted areas. Federal financial aid was first played up by the National Association of Real Estate Boards, and later advocated with decent restraint by its serious-minded offspring, the Urban Land Institute.

In the course of this paper, it will be our purpose to distinguish between the Greer-Hansen proposals and the proposals of the Urban Land Institute; and to show the difference in the instruments as well as difference in the makers. We shall refer to the pamphlet published by the Federal Housing Administration, prepared by the able city planner, Frederick Bigger, which, though part of a different symphony, is written in a sympathetic key. The attempt will be made to explain the differing point of view of the writer, and the progress and results of the research in Land Utilization carried on under the sponsorship of the New York Building Congress.

II

Although Mr. Greer's article[1] published in the most recent issue of this *Journal,* begins with a tribute to Ebenezer Howard and the Garden City school of city planners, Mr. Greer and his associate, Professor Alvin Hansen, are not primarily concerned with urban redevelopment. Their chief concern and responsibility is to balance employment after the war. Avowedly they belong to the school of thought which advocates increased governmental spending in volume sufficient to counterbalance the expected failure of private post-war industry to provide complete employment. They see in urban redevelopment a channel for the use of a large proportion of the labor that may need reemployment after the war. They recognize that the condition of our cities is due largely to the mistakes of

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* Fellow, American Institute of Architects, Member of Committee which drafted N. Y. Urban Redevelopment Corporations Act.

[1] Guy Greer, "City Replanning and Rebuilding," *The Journal of Land and Public Utility Economics,* August, 1942, pp. 284-292.

the past; hence they argue that these mistakes should be charged to society as a whole rather than to the owners of blighted properties.

In a nut-shell, Mr. Greer expresses his argument in this paragraph: "Upon approval of the appropriate agencies in Washington of all aspects of a proposal to acquire property, the government would be prepared to advance funds, if need be, up to the entire cost of acquisition." [2] This, in substance, is the same doctrine which Mr. Greer advocated before the June meeting of The American Institute of Architects. And it is the same doctrine enunciated in a paper published over the signatures of Greer and Hansen, which appeared in the April, 1942, *Harper's* magazine.

Mr. Greer's latest article[3] gives an excellent critique of the evils of real estate administration in the average city, and the growth of the central blighted areas. But Mr. Greer still adheres to the doctrine which he and Professor Hansen have announced – that it is best simply to "cut the Gordian knot" and have the federal government make an outright purchase of the blighted areas.

Every statement they have made has included this suggestion for a huge subsidy, followed by the implication that there is no real necessity for repaying fully the principal of the debt. Their argument implies also that the blighted properties might be turned over to the cities (thus making American cities directly subject to a centralized federal bureau). They assume that the cities will make payments to the federal government out of the amounts received from the properties. They leave it extremely doubtful, however, as to how much will be received because they insist that the need for the original subsidy lies in the fact that "elbow room" must be provided in the cities and that this simply cannot be done on an economic basis.

[2] *Ibid.*, p. 289.
[3] *Op. cit.*

III

From one point of view, it is a fine thing to have experts, retained by the Federal Reserve Board, come out for the redevelopment of blighted urban areas on a large scale after the war. It ought to be a source of encouragement to those who have studied the problem of urban redevelopment and who realize how difficult it has been to move toward a solution. Nevertheless, the proposals of Greer and Hansen raise doubts.

In the first place, their proposals fail to distinguish between the operation of credit and the function of bonded debt.[4] Professor Hansen has been a leader in decrying the fears of those who point out that the huge bonded indebtedness of the United States at the close of the war will be an obstacle to further governmental expenditure for the purposes of peace. It may be true that the public, suffering under the burden of taxes, fears all expenditures and fails to discern the difference between two methods of spending money – the first, by making credit advances which are liquidated and paid for as a result of the productive work liberated by the credit; and the second, by incurring a bonded debt for which property already in existence is pledged as security for repayment.

Certain British economists have had the theory that so long as interest can be paid on bonded debt, it is natural that those who have used their savings to buy the bonds should have no reason

[4] Cf., John T. Flynn, "Post-War Federal Debt – Why It Must Not Expand Limitlessly," *Harper's*, July, 1942.

for desiring the loan ever to be repaid. It is obvious that non-repayable loans build up cumulative volumes of interest, which ultimately counterbalance the advantages originally gained by the loans.

There has been too much confusion in the public mind between debt and credit. In this case Greer and Hansen join those economists who recognize that investors who receive interest in perpetuity have little desire to have their bonds liquidated. It is implied that the kind of debt which will be entered into for a subsidy for land purchase is the kind which does not need to be repaid. All this is advocated as part of a program which proposes the incurring of a huge debt because there is not time to solve the land or tax problems.

A realistic understanding of the distinction between the institution of debt and the institution of credit is needed. It is a fundamental quality of credit that it extends the work of money into the future and that the work liberated by credit should provide for the liquidation of the credit advanced. Civilization is based upon specialization of work done and the exchange of services performed by individuals. Money and credit instruments, in contrast to bonds, supply a system of counters to keep track of services that can be exchanged currently, or for the exchange of future or past services. When there are miscalculations or discrepancies in the measurements of values exchanged, buying power may be retarded and unemployment may develop thereafter.

When civilization lapses into war, balanced exchange is interrupted. While it is possible to measure war production in dollars, there is no balancing measure of exchange value. Society as a whole pays for the use of war products by taxing the public. Under war conditions this has to be done on a scale far greater than the public can immediately pay. Hence the government gives its bonds and levies taxes over an extended period which is considered sufficient to repay interest and principal.

In peace time, it is obviously an advantage to society to have as large a proportion as possible of the goods and services which it produces made the subject of measurable exchange. This is particularly important just after a great war when an exaggerated accumulation of bonded debt has been built up to cover the breakdown of exchange during war. This is a prime reason why the outlet for labor after the war should be sought in fields where it is possible to restore a balance to economic exchange. In the vernacular, there should be an increase in the proportion of projects which are "self-liquidating."

Looking at the matter from the opposite direction, there are certain channels of activity where dislocations now exist, due to speculative or unnatural forces, and where there is urgent need for restoring industry to an economic basis. There is need for better relationships among construction, real estate management and real estate finance advocates.

One of the greatest causes of the difficulties which have beset real estate has been the failure of real estate to liquidate its bonded debt. Real estate has miscalculated its ability to pay out interest and profits prior to providing for the amortization of its mortgage debt. Real estate needs to be put back on an exchange basis and restored to a productive role in the economy of social exchange.[5] It needs to be changed from a basis of bonded debt to a self-liquidating credit basis.

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[5] Cf., Arthur C. Holden, *Money in Motion — The Social Function of Banking*, (Harper & Bros., 1940), Chapter ix, "Method and Credit Flow".

The researches of the Land Utilization Committee have led to recommendations which are designed to make this possible. In any crisis, resources are pooled in the interest of public safety: In a real estate crisis, existing ownership and existing mortgage interests may be pooled for emergency management. Each owner and mortgagee may be given certificates, certifying that he owns, not so many dollars' worth of real estate or of stocks or bonds, but a certain ratio or proportion of the combined redevelopment project.

Assuming that a blighted condition over a large area of real estate indicates that a crisis exists, in such a crisis it is reasonable to resort to a pooling of interest. Such pooling permits a redistribution of land use. The land will then automatically be brought under a united cooperative ownership. Existing debts will be cleared from the project by the reorganization. The pooled project will then be eligible for new credits to pay for improvements. Provision should be made so that the new credits can be liquidated as rapidly as possible through flexible amortization payments. Interest should be held down to a figure sufficient to cover servicing by the banks and the Federal Reserve.[6] By such a method the whole process of urban redevelopment may not only be conducted on an economic basis, but it may be made the means of putting an end to the uneconomic practices in real estate finance which have done so much damage to the financial machinery of the entire nation.

Mr. Greer passes over the administrative obstacles and details. He says, "We shall have, after the war, the greatest productive organization in our history. Our equipment and skilled manpower will be all set and ready to go." [7] Speaking as an economist of the Federal Reserve Board, he implies that this manpower must be set to work at any cost. He rushes at urban redevelopment. "Upon approval of the appropriate agencies in Washington of all aspects of a proposal to acquire property, the government would be prepared to advance funds, if need be, up to the entire cost of acquisition. *Possibly repayment of the principal might be required,* along with a share of the subsequent net proceeds from the property in lieu of interest." Yet, a few paragraphs previously, Mr. Greer had said: "The acquisition (of blighted areas) would be a by-product of the job of clearing away the obstacles to redevelopment, *in arriving at a decision as to its subsequent use, the land should be deemed to have cost nothing.*" [8]

There is a fundamental inconsistency here. Mr. Greer wants the federal government to rush in and do a big spending job. He says there must be "elbow room" in the revamped cities. To gain this "elbow room" he insists that the only practical way is to charge off acquisition cost and assume that the land has cost nothing. Yet he implies that the cities are going to be able to lease or sell the land and that the cities may be asked to pay back perhaps two-thirds of what they get for the land over a period of fifty years. That does not sound like *land costing nothing.*

When Mr. Greer attempts to look at the problem from the point of view of the blighted areas, he finds two reasons for the use of federal funds for land purchase. First, he says the local governments lack adequate legal power to

[6] *Ibid.*, p. 185.

[7] Address before American Institute of Architects, Detroit, June 24, 1942, published in *Record & Guide,* July 18, 1942.

[8] *Italics are ours.*

control the use of their land areas. The second, he says, is a "financial reason". He implies that it is because land costs so much. He neglects the fact that outmoded and uneconomic practices in real estate finance have disturbed the foundations of our general financial system. He fails to realize that there can be no stable system of national finance until a way can be found to put real estate on a sound financial basis. He fails to appreciate that *the deplorable condition of the blighted areas of our cities has created a crisis that opens the way to the rehabilitation of financial methods, as well as to the physical rehabilitation of the properties themselves.* The financial problems of real estate will not be solved by merely pouring out millions of dollars from the federal till, even if these millions are sufficient to induce present owners of blighted real estate to sell, and sufficient to cover such costs as may be established by condemnation awards. Nor will it help the financial chaos, which is probable after the war, merely to spend lavishly, except where an economic return is indicated, and unless the spending will tend to improve rather than to disturb further the economic balance of exchange.

IV

Let us consider briefly whether the lack of legal power in local government is as great as Mr. Greer believes it to be. It is necessary first, to consider the source of power as well as the functions which are exercised by federal, state and local governments respectively, and by business. The control over financial power rests with the federal government. Congress has the exclusive power "to coin money, regulate the value thereof and of foreign coin." Congress also has the right to make "uniform laws on the subject of bankruptcies throughout the United States."

All advocates of urban redevelopment agree that a critical situation faces our cities due to the blighting of large areas in the congested central sections, as well as some of the newer outlying sections that have been blighted by arrested development or change in character. Many of these blighted sections may be considered as bankrupt or as rapidly approaching a state where an increasing number of the properties in them are in actual default. Where contracts cannot be enforced according to the letter, there is need for reorganization. In this case the need is for group reorganization rather than reorganization on the basis of individual bankruptcies. An extension of the definition of bankruptcy to cover real property would permit the federal government to formulate procedure to aid the financial rehabilitation and reorganization of whole areas of blighted properties as integral units.

The federal Constitution has wisely given Congress wide powers for the control of finance. The general financial stability of the nation may be brought into jeopardy by unsound conditions in real estate finance as readily as through unsound conditions governing short-term note issue. If the areas of blighted urban real estate continue to increase, it is a threat both to the stability of our mortgage system, which is vital to our great fiduciary institutions, as well as to the tax structure of our cities. The Constitution has given the federal government the responsibility to maintain sound monetary and fiscal systems.

For the prevention of municipal bankruptcy it is essential to recognize that the blighted area problem is essentially a matter for group treatment. Bankruptcy procedure should be brought up to date. It should be made mandatory

for the creditor and debtor interests in blighted real estate to face reorganization as a problem of group reorganization.

V

Although the federal government has as yet failed to set up any procedure for dealing with economic problems on a group basis, many of the states have shown themselves awake to the new point of view. When investors in mortgage bond issues found their securities in default, it was not the federal government that passed emergency legislation; it was the State of New York. Under the Schackno law[9] the principle was established that upon the petition of the majority of the holders of an issue of mortgage bonds, an administrator could be set up under the supervision of the state to take over the properties and administer them in the interest of the majority. This is an important piece of legislation because it recognized the fact that the state may compel the consent of the minority to permit an administrator to set aside the letter of a contract and to work out new agreements which a change of circumstances indicate, may be more likely to promote the spirit of the contract and promote the general interest.

New York State was also the pioneer in legislation which helped to establish the efficacy of group procedure from another point of view. Under Article III of the Banking Laws, the Savings Bank Trust Company was established. Savings banks were permitted to deposit defaulted or questionable mortgages with this institution and to receive in return therefor any securities which the Bank or its affiliate, the Institutional Securities Corporation, might receive as evidence of a composition of the original agreement.[10] Unfortunately, this important legislation did not recognize neighborhood proximity as a basis for administering defaulted mortgages. It did, however, recognize two important principles: first, that the defaulted mortgages could be handled in quantity through specialists far more advantageously than as individual problems; second, that it was essential to give fiduciaries the right to vary or compose mortgage agreements in cases where it had been found impractical and unwise to demand literal adherence.

In 1940, New York State[11] went a step further by granting to all types of fiduciaries the right to exchange defaulted mortgage agreements for the securities of corporations organized for the improvement of blighted districts.

VI

The enactment of this law was followed in 1941 by the passage of the Urban Redevelopment Act.[12] This was the first piece of state legislation to recognize the potentiality for self-government in a blighted district. After defining "blighted areas" as an "area" so designated by a city planning commission, the law states that plans may be made for the redevelopment of an area when 51 per cent of the properties have assented to the plan or come into the control of the urban redevelopment corporation. Compulsion may be exercised through

[9] Chapter 745 of the Laws of 1933 (Certificate Holders Reorganization Act).

[10] Cf., Chapter 493 of Laws of 1934 adding Sec. 239-b to Banking Laws; amended by Chapter 352 of Laws of 1938, adding Sec. 234-a; amended by Chapter 790 of Laws of 1939, adding Sec. 234-a.

[11] Real Property Law, Sec. 278-a, Chapter 886 of the Laws of 1937; amended by Chapter 446 of the Laws of 1940.

[12] Chapter 892 of the Laws of New York, 1941 (Urban Redevelopment Corporations Law).

condemnation if necessary to bring the balance of the properties into conformity with the plan.

In principle, the Urban Redevelopment Corporation Law establishes the local neighborhood as a recognized legal entity. The great growth of our metropolitan cities has widened the gap between the individual and the incorporated municipality. As this gap has widened the individual has lost an effective means for exercising a control over the physical growth and well-being of his neighborhood. As the city has grown it has come to be thought of more and more as a subdivision of government rather than as a corporate entity organized to perform certain social and neighborhood functions.

The New York Law of 1941 reestablishes a local corporate entity and makes this local corporate entity a vehicle of initiative for neighborhood improvement. In this approach the proposals of the National Association of Real Estate Boards and of the Urban Land Institute have followed the example of New York. The original proposals of the real estate group went a step further in advocating that the local neighborhood should be given the power of levying a special tax for neighborhood maintenance. The proposals of the National Association of Real Estate Boards reflect the experience of some of the best and most farsighted developing builders which the country has produced. Men of this calibre have passed beyond the stage where "subdividing" means cutting up land into lots and getting rid of these through sale. The enlightened developing builder realizes that real estate administration is something more than sales. The more farsighted developers have written into deeds restrictions designed to protect the general good of the community. By this means they have been able to enforce even compliance with a general architectural design and therefore to reduce architectural disharmonies. They have also reserved to management the right to levy assessments where parties to the agreement neglect to maintain required standards, plus the right to levy a maintenance toll for services supplementary to those ordinarily furnished by municipalities.

The National Association of Real Estate Boards has contended that policies which have been applied successfully by developing builders in new developments ought to be tried for the rehabilitation of blighted areas. They propose, first, to use the power of eminent domain to recapture blighted properties. They then propose to make the incorporated neighborhood responsible for issuing new deeds carrying restrictive covenants adequate to control the improvement and maintenance of the neighborhood. The Illinois Law is largely based on these proposals.

From certain quarters there has come violent opposition to this type of legislation, based on the ground that private property should not, and can not be taken under the right of eminent domain except for a public purpose. There are several ways of meeting this criticism. In amending its constitution in 1939, New York State wrote into Article XVIII a phrase making the replanning of blighted districts a public purpose. Thus land may be acquired through eminent domain for replanning purposes.

The most obvious answer, however, and the one which can be applied anywhere, is the alternative offered by Messrs. Greer and Hanson: Get enough money and buy up the properties, thus satisfying the owners even if it costs more that way.

VII

Although the real estate boards first hoped to secure private capital to assemble land, the Urban Land Institute has expressed itself as willing to have the blighted land problem solved by federal subsidy for purchase. It does not seem to the writer that sufficient study has been given to the terms on which the land thus purchased may be transferred to the new owners, or to an owning corporation. Unless there is to be open bidding for it, there may be grave danger of arbitrary favoritism. If the bidding is made open and individuals are permitted to take up small parcels, these individuals must agree to the new protective restrictions. This much is salutary. If the bidding is not limited, there will be a motive on the part of the government agency making the assembly to seek a speculative profit. In the event that the federal government pays the whole cost of assembly and it is then assumed, as Mr. Greer suggests, that the land costs nothing, it is obvious that the municipality would be placed in the position of exploiter if it sold the land at high prices; while individuals would be the exploiters if the municipality sold at low prices. It is obvious that assembly by such method leaves room for many conflicts of interest.

If the land, after assembly by eminent domain, is to be turned over to an owning corporation at a low price with the privilege of reselling the land, and such a corporation becomes dependent upon the profits of land turnover, again there is reason for criticism. If, on the other hand, the corporation is to be made the legal person of a cooperative neighborhood, it becomes not a potential exploiter but the valid agency to be entrusted with property acquired through eminent domain. Such a corporation would act as trustee for the group interests of the neighborhood. If this is to be the attitude, then it is hard to see why a federal subsidy must be put up to effect a change in neighborhood ownership.

VIII

Under the plan put forward by the Land Utilization Committee, the problems of land turnover are avoided by the proposed method of land assembly. The plan is based on the theory that it is the function of government to authorize and codify procedure and to protect society against abuses. It assumes that it is not the function of government to take part in enterprise except where enterprise cannot be conducted on a basis of services exchanged. Therefore, it is suggested that government offer advantages to individuals who perform services which are socially useful.

The design of the New York Urban Redevelopment Corporations Law is to give a charter to the interests which comprise a blighted area and to weld them into a corporate entity, representative of the neighborhood. This is the essence of the whole program. It is designed to stimulate and give a vehicle to local initiative. To the majority of the properties it gives the right to guide the development of the neighborhood according to a plan agreed to by the majority and approved by the City Planning Commission as in harmony with the master plan for the city. If minority interests refuse to conform, eminent domain may be invoked to deprive owners of such rights as are considered antagonistic to the approved plan.

At the time the New York law was drafted, some critics were insistent that non-property-holders should be given a vote in the affairs of the local redevelopment comporation. Since, however, the

greatest difficulty to be encountered was the removing of the existing legal, economic and physical obstacles in the way of the assembly of property, it was believed inexpedient to complicate these difficult matters by giving a vote in the redevelopment corporation to non-property-holding members.

It is the writer's belief that, after experiment has shown the use to which the urban redevelopment corporation may be put as a democratic vehicle for the assembly and control of neighborhood properties through the pooling of property interests, a way will be found to admit tenant members of the locality into a share in the control of the incorporated local district. If this takes place, it will follow historically the gradual development of the incorporated municipality, which, it will be remembered, did not at first admit the non-property-holding citizen to the municipal franchise. It must be made clear above all things that the urban redevelopment corporation is a new type of entity—a local, incorporated neighborhood—chartered to act almost in the capacity of a trustee to reorganize the well-nigh bankrupt properties of which blighted neighborhoods are composed. Such an entity is essential today to redivide our overgrown cities into units which are smaller, more capable of performing corporate activities and which are nearer to the individual human scale.

IX

At this point it is well to state that the attitude of the Federal Housing Administration [13] toward the urban redevelopment corporation is one of complete sympathy. As a governmental agency charged with the task of insuring mortgages, the F. H. A. has consistently supported every move which promises better neighborhood planning, and has recognized the protection of the neighborhood as a prerequisite to the protection of the individual home against depreciation and obsolescence. As spokesman for the F. H. A., Frederick Bigger has joined in advocating the "use of federal funds at very low rates of interest to aid municipalities to acquire land."

Other governmental agencies have also taken this point of view. Arthur Goodwillie,[14] representing the Home Owners Loan Corporation, framed a well thought-out program for the redevelopment of a large section in southwest Washington, D. C., as a war housing measure. Some evidence of the political spade-work that may be required before Congress will be willing to underwrite the purchase of blighted urban areas is evidenced in the flat refusal of Congress to vote any money to buy out the owners of blighted urban properties in Washington, D. C.

It is the writer's opinion that despite the difficulties of assembly through pooling, the project in southwest Washington would have stood far better chance of winning the interest of Congress had financial aid been sought at "very low interest" to set men to work on the replanning and rebuilding, conditioned upon the agreement of existing owners and mortgagees to pool their interests and to demonstrate that by the increase of managerial efficiency and physical desirability, they could work their way

[13] Cf., pamphlet previously referred to in text: "A Handbook on Urban Redevelopment for Cities in the United States", prepared by Frederick Bigger, November, 1941, for Federal Housing Administration.

[14] Cf., pamphlet: "The Rehabilitation of Southwest Washington as a War Housing Measure." Conservation Service, Home Loan Corporation, January 2, 1942.

back to solvency and could gradually *repay* the governmental credits advanced for reconstruction and rehabilitation. It is true that the city of Washington has no urban redevelopment act; but it has an agency in the Alley Dwelling Authority which is qualified to take, through eminent domain, such minority properties as might have refused to enter into an agreement to pool, to replan and to redevelop.

X

It is most important to understand as many of the forces which are exerting pressure for urban redevelopment as can be identified, and to interpret the direction which these forces are likely to take. Some confusion has been caused recently by the enactment in New York State of an additional piece of legislation known as the Redevelopment Companies Law,[15] just one year after the passage of the original Urban Redevelopment Corporations Act. The background of this law is very different from the first. There will be a motion at the next session of the legislature to codify the two laws in a single understandable chapter. Basically, the difference in the two acts lies in the group which is expected to take the initiative. The law of 1942 authorizes fiduciary institutions to put their investment funds directly into the stock of urban redevelopment companies. Hence, an opportunity for initiative is given to the great sources of private investment funds, namely the life insurance societies and the savings banks. The law was sponsored by Louis Pink, New York State Superintendent of Insurance, and by Park Commissioner Robert Moses. The idea was to tap the largest source of private funds available, buy up huge areas, clear them on a big scale, and build on a big scale.

The idea is a valid one; it should be given an opportunity to operate. The great fiduciary institutions have a need for enlarged outlets for their investment funds. It is wise to tie this need into the urban redevelopment program. But the value and purpose of the 1941 Urban Redevelopment *Corporations* Law should not be lost sight of. In it, the design was to give the initiative to existing interests in blighted areas and make it possible for existing equities and existing mortgagees to combine in such a way as to act in concert for their own salvation, through the agency of an incorporated — cooperative — neighborhood, known as an Urban Redevelopment Corporation.

XI

It is important to recognize that urban redevelopment is not simply a process by which many undesirable and outmoded properties may be swept away by a grand gesture, and new cities beautifully designed and suitable for modern needs may spring into being as a result of the great increase in efficiency which modern technology has produced.

Some projects may be carried out by large acquisitions of blighted properties, and by the clearing of these, and their replacement by huge housing developments such as would delight the heart of the most efficient modern administrator or bureaucrat. For the majority however, evolution will be slow, planning will be complex, and the replacement a progressive process to be carried out in gradual steps. The point to be stressed is that things should be done in such a way as to reduce the conflicts in interest between tenants and owners, mortgagees and the construction indus-

[15] Chap. 845 of the Laws of 1942 (Redevelopment Companies Law).

try, and the various services rendered by the municipality and by public utility corporations, which have plagued and retarded the redevelopment of blighted areas in the past. Emphasis should be put upon the need for bringing these interests into harmony and for developing, through group action, a concert of interests.

Above all things, the system of finance used should be such as to reflect the functions of production and consumption, and the balancing of these through exchange. The disorganization in real estate finance is a sign that we have lost an understanding of many of the things that have been done. Such understanding cannot be restored by attempting to circumvent the difficulties by a huge system of federal subsidies. While the writer welcomes recruits to the bandwagon, he is insistent that urban redevelopment must be coupled with group planning, plus an understanding of group procedure, and that the improvement of long-term realty finance is an essential part of the procedure that must be developed.

The Subdivider of Today and Tomorrow

By JOSEPH LARONGE *

THE current World War may be held accountable for an arrestment of normal subdivision activity. The word normal is used because the acute need for defense housing accelerated allotting, but such developments are "typed" and for the purpose of this discussion are disregarded. The careful selection of location and the thoughtful planning necessary in subdivision work do not characterize defense housing allotments. An emergency existed—speed was essential—completed house and lot could not exceed the sale price of $6,000 and location to a great extent was determined by proximity to industrial plants. Under these conditions subdivisions that have come into being since "Pearl Harbor" do not typify the normal subdivision as hereinafter interpreted. We are concerned with the post-war era when normal activity may again be resumed. Remembering that for the duration, government regulation will curtail building, we must foresee the rapid movement which will follow the war. We are under-housed now and, assuming the conflict will last for a period of years, the need for residential units will greatly expand. Land underlies all. To house the populace adequately, our interest must first center upon sites. The problem will be placed squarely before the subdivider. His activity precedes that of the home builder. Upon his forethought, ingenuity and perception will depend the success or failure of future residential construction. Your author therefore asks that the reader consider the following text as post-war projection. To prognosticate properly, a brief review is desirable.

The depression of the 'thirties, as we knew it, brought about marked changes in many lines of endeavor. In the field of allotment development, it may well be said that the trend of thought has been almost revolutionary in the past decade. Whether the depression was the principal reason for such progress or whether it was merely a hastening cause, is a question of little moment. The commencement of the business decline which marked the decade of the 'thirties delineates sharply the sudden movement toward sanity and planning in the field of allotment development. A staggering proportion of such projects promulgated during the 1920's and before were simply "houses of cards" which remained standing on the impetus of general business inflation and fell like the leaves in autumn at the first sign of the reverse trend in the economic cycle. Many such promotions failed simply because the depression made it impossible for enough people to purchase vacant lots at a sufficiently high price to warrant profit to the entrepreneurs – many, however, would eventually have failed without the depression or if not, would have developed into neighborhoods which would have declined very rapidly after their establishment as such.

Another general factor which contributed greatly to the vacant land debacle was the cessation of the rapid growth in our population in the United States. The steep upward line marking population increases in the late years of the last

* Member, Board of Directors, National Association of Real Estate Boards; President, Joseph Laronge, Inc., Cleveland, Ohio.

century and the early years of the present century, turn sharply downward to a position nearly horizontal, with the virtual stoppage of immigration at the commencement of the third decade. The effect of this stoppage, however, was not felt until the later years of the decade and the beginning of the depression. The population of the United States has not yet become static but for all purposes the annual increase is now negligible. It was a relatively simple matter to ferret out a large parcel of vacant land on the outskirts of an urban area, lay out a few streets, subdivide it roughly into lots, install a few improvements, advertise and sell the individual parcels during the period when there was a constant demand in this country for new homes and new home sites. Even though the wave of newcomers ceased, subdivision development was propelled by the momentum of the post-war boom. Pay envelopes bulged, and vast numbers, theretofore obliged to live in rented dwellings, became home owners. The elevated standard of living similarly caused the owners of modest homes to reach up for something a little larger and better. Near the end of the third decade of this century, however, when we had neither immigration in any appreciable quantity nor a business boom, the countless thousands of vacant lots on the market and as yet unsold at that time, became a problem which has not been adequately solved. In Cuyahoga County, Ohio, embracing Greater Cleveland, as of March, 1941, there were approximately 133,000 subdivided vacant lots awaiting sale, of which over 90,000 were residential in character. The 1939-1940 tax list indicated approximately 160,000 delinquent parcels in this county of which about 120,000 were vacant property.[1] In one suburb of the city of Cleveland over eighty per cent of all the parcels located in the municipality were encumbered with tax delinquencies.

The allotment developer has benefited from the experiences of the past and realizes that his work is not only a business, but an art and a science. The day when lot-selling was as simple as a cross-counter transaction has long since passed, resulting in a general betterment. The needs of the community, the wants of prospective buyers and the peaceful enjoyment of adjacent landowners, are necessary considerations in the development of allotments. A real responsibility rests with the person who creates a subdivision. He is fashioning a part of a city and he assumes a burden to coming generations as well as to persons who might be immediate, prospective purchasers. His first consideration is whether any need for new land development exists in the community. After having determined such a need, his next problem is to seek out the proper location, having in mind community-development as well as personal profits.

It is the purpose of this article to indicate the progress in the field of subdivision and in doing so the author has treated the subject under a number of sub-headings. In some instances the material overlaps and parallel situations might be described under different groupings. With this in mind, however, an attempt has been made to avoid needless repetition.

Location

In former times the site was often determined by the location of the property already owned by the promoter, or available at an exceedingly low price. Frequently vacant land, miles from trans-

[1] These statistics apply to the period prior to the advent of the so-called $6,000 Defense Home.

portation, schools, shopping or other facilities, was consequently selected. In the past the use of high pressure methods often resulted in volume sales regardless of quality. Land developers anticipated and preceded the outward growth of the community much more rapidly than the population growth then warranted. If the trend happened to be eastward from the center of the city, an allotment east of the city was felt to be justified, although vast stretches of vacant land may have existed between the outward extremities of the built-up section and the parcel in question. It was simply assumed that streetcar lines, main thoroughfares and other conveniences would eventually be extended to and beyond the new development. Often this did occur and by mere chance alone such projects were successful from a business standpoint. More often, however, cow pastures were foisted upon the public by enterprising promoters and in many such cases the land has since returned to the cow pasture state. Now population trends are studied and are broken down into neighborhood trends. It is necessary to know the absorption possibilities of a community and a neighborhood before determining upon a particular site. Many of the successful allotments in the immediate past were, and those in the predicted future will be located just beyond the last outpost, in the path of development. It may be safely assumed that a market will exist for the many parcels disregarded by previous developers. Thought should be given to the convenience of the prospective home occupier with respect to shopping districts, schools, police and fire protection, libraries, parks, playgrounds, utilities and all the other factors which are tributary to modern-day living.

Topography

Ingenious effect can be obtained by a proper use of the topography. Thought must be given, for example, to the layout of streets over and around rolling hillsides with a view to artistry and design; very high sections are generally reserved for expensive homes; very low sections are ordinarily not used at all for residential development, but for parks, playgrounds and scenic effects. Natural groves and small bodies of water can be made to fit into the composite picture in such a manner as to embellish the entire panorama. Large developments ideally lend themselves to such adoption, whereas conversely, these touches of artistry are difficult of accomplishment in small tracts. Other than in a few notable exceptions, it was not thought necessary, in days gone by, to give consideration to such factors. It is essential for the designer to be inventive in order to take advantage of every beneficial possibility.

Street Layout

The standard plan of early land development was the gridiron. As is well known, it simply consisted of one or more streets running in one direction and a number of cross streets intersecting at right angles to form a simple rectangular pattern. Why not? It was simple, inexpensive to lay out and it served the purpose. The purported saving, however, often resulted in a costly profit. The land architect or engineer should be brought into the picture to give effect to proper street width, graceful curves, rounded intersections and a pattern which in general conforms to a major street plan and to the plan of developments adjoining the one in question. Dead-end streets are avoided where possible, but where necessary, suit-

able culs-de-sac are provided with proper room for automobile turns, and with intelligent layout of lots around such turns. In long, dead-end blocks which might otherwise require two cross streets, a loop with artistic lot layout should be provided, thus avoiding through traffic. Where possible, streets should be so installed as to avoid through traffic in order to provide greater safety and reasonable quiet in the development. Building set-backs depend to a great extent upon the lot depth, and should be imposed so as to establish a degree of uniformity throughout the development.

Lot Layout

The size, shape and location of individual lots are now arranged so that they are not only salable but are consistent in every respect with the future convenience and comfort of the homeowner or occupier. Unusually small lots as well as disadvantageously-shaped lots are avoided where possible. Lots unusually large in comparison with the surrounding parcels, are also known to be a drug upon the market. In any relatively homogeneous section lot areas should, generally speaking, be of uniform size. In developments consisting of small homes of the average type, it is preferable, in order to obtain a given lot area, to add to the width of each lot and reduce the depth, thus permitting the use of an attached garage at the side of the residence, giving it the appearance of greater size than would be true if the garage were in the rear. By and large, subdivisions should be planned so that the lots are at right angles to the streets upon which they face, thus avoiding the possibility of a saw-tooth arrangement of homes. It is always preferable where possible to avoid butt lots.

Utilities and Improvements

Countless thousands of persons have in years gone by, purchased vacant lots as investments or for home building purposes, believing that in locations on the outskirts of town, their taxes for years to come, would be relatively low. Instead they were immediately burdened with annual special assessments far out of proportion with the value of the land involved. The installation of paving, sewers, water lines, sidewalks and other conveniences, through special assessment procedure, is an unsound practice, and should be avoided whenever possible. The improvements should be paid for by the land developer, and represent a part of his capital investment. In the heyday of haphazard expansion the cost of the improvement was assessed against the land, or in many instances the improvements were only partially installed. Just enough was accomplished to make land selling possible. Streets were rough graded, makeshift sidewalks were provided and perhaps water mains installed. Essentials such as paving, permanent walks, sewers, etc., were promises only, often not fulfilled. Lots were then sold to an unwary public who in many instances never realized the fulfillment of these promises. The weeds of failure are still found growing down the middle of many such streets and between the cinders of many such sidewalks.

Notwithstanding these adverse situations, and without particular credit to the promoter, many developments were financially successful. The unsuspecting were many and the necessity for homesites great. Too often, however, poor planning and excessive assessments resulted in rapid neighborhood decline, abandonment by purchasers, inability of

the developer to meet mortgage and tax liabilities, and subsequent forfeiture.

Landscaping

By the use of foresight in selecting a location, advantage may be taken of topography, contour, groves, trees, etc., by incorporating these features in the allotment design. In addition, the informed developer realizes that nothing so adorns and bedecks an otherwise bleak landscape as do trees, shrubs and plantings. Every home owner desires these, and when provided by the allotter, uniformity throughout the development is assured and the sale of property accelerated. A landscape architect should be consulted in the designing of every allotment. The trees should be consistent with the character of the proposed development. It has been suggested, for example, that formal rows of trees along both sides of the street are appropriate in most medium and low-cost subdivisions, but would probably be undesirable in large spacious developments planned for homes in the country estate class. Here informality and ruggedness should be the objective.

Conveniences for Residents

A part of the task of overcoming sales resistance is the provision of the normal living conveniences for residents of a district—items which were often wholly overlooked in years gone by, when mushroom growth was the rule rather than the exception. Today's purchaser of a home or a home site, is interested in knowing the proximity to shopping centers, schools, churches, transportation, etc. If these are not readily available, they should be provided as part of the development. Recreational facilities represent another matter of importance to which consideration should be given by the allotter. In a project with a rolling topography, it is advisable to use the low areas for parks and recreational facilities, inasmuch as such land represents the least desirable location for homes. Such public spaces, properly maintained, enhance the beauty of the entire development. Thus salability is facilitated and greater residential enjoyment assured.

Architectural Control

The most revolutionary change in allotment progress is the development of the idea that the promoter should not only subdivide and sell vacant land, but should erect homes and offer the finished product for sale. The public has ceased investing in vacant residential lots for speculative purposes, nor even to as great an extent as in the past for the purpose of erecting residences for use. A large proportion of the buying public desires to see the finished product in kind, rather than in the blue print stage. The average person is not a home builder, and does not care to be burdened with the details of home construction. The subdivider-builder while requiring a larger capital investment, is afforded a better opportunity for architectural control. The type of dwelling should be governed by a consistent plan. This does not mean that residences should be of the same size, built of the same material and have typical front elevations. Monotony should be avoided. Dwellings on a given street should be so designed that their appearances synchronize. This is the ultimate goal of the successful allotter. Such artistry involves not only the design of the buildings, but also presupposes collaboration with the landscape architect and the topographical engineer for the purpose of arranging for unity and character in the entire subdivision. A central feature

about which the entire development is oriented often aids in acquiring such unity. It might be a school, a body of water or a park, around which many of the houses are built. Whatever it may be, it tends to bind together the various component parts of the whole.

Restrictions

In the early days of allotment development too little thought was given to the matter of restrictions. Usually setbacks were provided for, some general use restrictions imposed, and the type of dwelling regulated almost entirely on the basis of its cost. No home, for example, could be erected in a given allotment unless its cost equalled a certain stipulated figure. Such regulations were at all times difficult to enforce, since the word "cost" was so all inclusive that disputes arose as to its definiteness, and in addition, with cyclical economic changes and improvements in home building, costs varied from time to time, thus tending to defeat the purpose of the restriction as it related to the figure originally imposed. This often resulted in a conglomeration of buildings which had a detrimental effect on a street or subdivision as a whole.

Only to a small degree did restrictions regulate the kind of residences to be erected, the materials to be used, etc. The cost of a building as a criterion is out-moded; it is no longer an important matter except incidentally. Neither building codes nor zoning laws are generally the answer to the problem, inasmuch as they usually only represent minimum requirements.

The design of the dwelling, its size, its height and its location on the lot, as well as the location of garages, are important factors. It is difficult to stipulate in advance all the detailed regulations controlling future residential construction, hence the modern trend dictates the submission of detailed plans and specifications to a central authority for approval before work is commenced. Such procedure should include additions and exterior changes effecting architectural design. This is the most satisfactory method of assuming proper control over the entire development.

Sales Methods

The subdivider of twenty years or more ago was generally interested in one result only, namely, the profit he could obtain. He rode "high and handsome" on the popular wave of artificial inflation. He took advantage of the idea then prevalent, that good times were here to stay, that population would continue to increase, that business would be better each year, rather than worse, that the bubble would never burst and that the curve indicating cyclical trends would continue to bend upward and upward forever. This idea was impressed upon a large proportion of the buying public, who at the time were convinced that vacant residence lots were good future investments. This included persons in all income groups. Many sales were made with an extremely low initial payment, and high subsequent monthly installments, in addition to interest, taxes and overpowering assessments. Some people who could not afford to own their homes, nevertheless made speculative, quantity lot purchases, with a view to quick resale for profit.

Many subdivisions were subject to heavy mortgage encumbrances. A large proportion of sales were made on a land contract basis, providing for conveyance by deed when the purchase price had been paid in full, or when a substantial amount had been paid on account. The history of what occurred is too well

known to require lengthy comment. Suffice to say, that overburdening assessments, inability to meet mortgage amortization and interest payments, the depression and other adverse circumstances, brought about default on the part of many subdividers, with resultant foreclosures, and loss of the purchaser's or land contractee's equity.

Lots were sold from plats containing beautifully decorated, graphic and word descriptions of the new territories to which the city was growing. The newspapers were full of advertisements so worded as to entice the buying public. Salesmen by the score were whipped up to a fever pitch. They imposed upon their friends and upon relatives in order to earn commissions. Prizes and bonuses were offered as incentives. In general, many of the ills of installment-buying were apparent in the average allotment development of yesterday. The obvious occurred. The supposed never-ending upward curve of the business cycle abruptly ceased and turned downward with a suddenness which surprised even the wary. Thousands of average citizens became penniless and found themselves weighted with obligations impossible to meet. Taxes became delinquent, foreclosures and forfeitures resulted and hundreds of miles of street frontage became prairie land.

The past indicates clearly that residence lots should not be acquired for speculative purpose, but primarily for use. Individual home sites should be sold for cash, or upon a substantial down payment. When the entire purchase price is not paid, conveyance should be made by deed rather than by land contract, and the unpaid balance should be represented by a purchase money mortgage in the usual form. Before a home is erected, ordinarily this obligation is paid in full, and a loan made to enable the construction of a building. The second mortgage plan heretofore in effect, is a thing of the past, just as is the land contract. F.H.A. financing and the ordinary home loan where the F.H.A. is not utilized, providing for monthly payments over a long period of time until the obligation is completely liquidated in equal installments, have replaced the haphazard uneconomic financing of the past. The subdivision of "tomorrow" with installation of utilities by and at the cost of the developer, recognition on the part of all that lots should not, generally speaking, be acquired for speculative purposes, and the desire of the prospect to purchase a site for prompt construction of a home, make unnecessary the "high pressure sales methods" heretofore employed.

The trend indicates a demand on the part of the purchaser for the finished product — "house and lot" — nevertheless, the possibility of selling groups of lots to a speculative builder should not be overlooked. Care must be exercised in selecting only contractors of repute, and their plans and quality of workmanship and materials should be subject to rigid scrutiny. Caution should be taken not to stifle initiative by injecting too much control. Yet uniformity to the original plan and purpose is salient. It therefore behooves the developer to point predominately to this end.

Summation and Future

Progress In Allotment Development has been treated under the following sub-headings: (1) Location, (2) Topography, (3) Street Layout, (4) Lot Layout, (5) Utility Lines, (6) Landscaping, (7) Conveniences For Residents, (8) Architectural Control, (9) Restrictions, and (10) Sales Methods.

A recitation has been made of the unscientific subdivision of the past. The inexperienced and un-altruistic promoter may be held accountable for many of the resultant tribulations. Those entrepreneurs who were impelled by a dollar sign alone, caused many of the ills that followed their regime. Economic conditions plunging the business curve downward, might be blamed for the balance. Shortsightedness, lack of proper restrictions and zoning, and inadequate planning, regardless of intent, all played a part. This procedure left in its wake non-conformity, shrinking or lost equities, squandered savings, waste land, forfeitures, tax sales, decaying utilities, and declining neighborhoods. Out of the ashes of failure, success is frequently born. Your author predicts just such a reversal in the allotment field. The lessons of the past, costly as they have been, point to a sane and intelligent future program. In recent years we have adopted many policies leaning toward the socialistic view. Similar action is not improbable in the vast subdivision industry. Would it be totally incorrect to look upon this enterprise as quasi-public, and to suggest the possibility of governmental regulation? In view of the past unintelligent handling of the situation and consequent monetary loss, it might be feasible to create a body of central control. Here research would be made to determine the need of a new allotment in any particular area. Complete real property inventories could be studied and correlated with vital statistics, immigration figures and other factors bearing upon the situation. Perhaps a priority system should be instituted. The same controlling body might pass upon general plans to assure conformity with adjacent sections already improved. Your author does not necessarily endorse this procedure, but merely advances the thought for readers' consideration. Whatever is done, should not be contradictory to our inalienable property rights. We are certain to witness greater comprehensiveness in subdivision work. Careful planning, cautious forethought, the enlistment of specialists, artistry and other factors heretofore mentioned, will characterize the allotment of the future. The establishment of a body of central control, protective restrictions and proper zoning will preserve investments and prevent "leftover" lots, which in the past could not be sold because of surrounding sectional decline. A total community plan into which each new subdivision must fit as a pattern, is logical. This will be accomplished, and when it has come to pass, we can look upon the preceding debacle not with scorn, but only as the instructor of the future.

The record evidences that the physical life of residences, due to neighborhood decline and change, has been greater than their economic life. The more we do to close that gap, the more stable will be the home investment and community life of the future.

Socio-Economic Conditions and Intercity Variations of Electric Use

By HENRY G. KNAF *

Purpose of Study

THE purpose of this study is to show by statistical means that the differences in social and economic conditions must be given considerable weight in judging the differences in domestic electric use among the larger cities of the United States. The statistical measures used are correlations, separately correlating each of the many factors representing living conditions with a measure of electric use. The fact that these factors can be singled out and successfully correlated with electric use in the presence of different rates in these cities is attesting to the magnitude of their effect.

The influence of such socio-economic factors upon domestic electric use has long been recognized and a number of excellent studies here and abroad are available on this subject. For instance, relationships between number of rooms, persons per family, or income on one side and electric use or appliance ownership on the other, have been shown conclusively to exist so that they may be accepted as economic laws. Each of these studies, even though dealing with large samples of consumers, confines itself to one city, usually showing the variables (number of rooms, persons per family, income, rent, etc.) by small steps and over a wide range. It goes without saying that with the investigation being confined to an area where the same rates prevail the rate factor as a possible determinant of electric use is excluded.

To explore the relationships between these factors and domestic use in a number of cities is quite a different problem. Here it is no longer possible to show the variables by small steps and over a wide range, but since each city is represented by only one figure for each variable, the lowest and highest city will determine the range. For instance, while the median monthly electric consumption per consumer runs from 20 to 70 kilowatt hours, the number of persons per family ranges only from 3.2 to 4.2 in the different cities, and the close bundling of points precludes any reasonable correlation. This of course does not mean that there is no relationship between persons per family and electric use. There undoubtedly is; but variations between cities in this respect are not great enough to demonstrate it successfully and precisely.

However, the problem here is not so much to establish relationships between socio-economic factors and electric use — this can be done more effectively in uniform rate areas — but to determine whether such relationships are strong enough to give satisfactory correlations when tested for a number of cities. In so doing one has to bear in mind that only one factor at a time is correlated with electric use and that all the other socio-economic factors as well as rate differences and variations in promotional efforts of companies are acting on electric use at the same time.

* Division Engineer, Bureau of Economic Research, Consolidated Edison Company of New York.

Existing Studies Involving Socio-Economic Factors and Electric Use

There are two outstanding studies[1] in which the statistical means of correlation has been used in connection with domestic electric use.

The first study deals with a number of communities in the territory of the Public Service Company of Northern Illinois and, to the knowledge of the author, is the first systematic attempt to demonstrate the relationships between purchasing power, or rather indicators of purchasing power, and electric use for a number of communities. The two authors point out that "the complicated array of factors present in any situation to be analysed prevent the use of simple and direct means of measuring the effect of each." They decided, in view of the difficulties involved, to confine their study to communities which were located in a uniform rate area. In this respect the present study goes beyond theirs inasmuch as it deals with cities having widely different rates. Nevertheless, their study is an important contribution to a comparative analysis of the variance of electric use levels in different communities.

The study by Warren M. Persons concentrates on electric refrigerator densities in the different states as influenced by climate and by rates. He finds that correlation exists between climate and refrigerator saturation but that there is none between rates and refrigerators. In other words, climate does, but rates do not influence refrigerator density in the different states. In addition, Prof. Persons demonstrates that refrigerator density is also affected by income levels as expressed by the ratio of income tax returns to domestic electric consumers.

Scope of Study

This study concentrates entirely on social and economic factors, related to the cities and their personnel, which directly or indirectly act upon electric consumption. Thus only such factors are considered here which lie outside the control of the utilities. The electric range and water heater situation is beyond the scope of this study inasmuch as the attitude of the companies regarding these appliances is a vital element in their development, with housing, social and income factors playing an insignificant part, as will be discussed later. No attempt is made to discuss rate differences and their possible causes.

The field for the study is the 94 cities of the United States having a population of 100,000 and over, according to 1937 estimates, and the 92 companies serving them.

Socio-Economic Data for Cities

The selection of the statistical material for the cities was greatly facilitated by a number of comparative sociological studies of American cities[2] which indicate the extent and availability of economic and social measures necessary for a study of this kind.

[1] W. J. Crowley & C. H. Baily, "The Relation of Electricity Consumption to Purchasing Power," *The Journal of Land & Public Utility Economics*, November, 1937, pp. 350-59; and Warren M. Persons, *Influence of Climate and Rates on Electric Refrigerator Sales*. Edison Electric Institute Bulletin, New York, November, 1936.

[2] Cf., W. F. Ogburn, "Social Characteristics of Cities," International City Managers Association, September, 1937, Chicago: E. L. Thorndike & E. Woodward, "Individual Differences in American Cities: Their Nature & Causation," *American Journal of Sociology*, September, 1937: E. L. Thorndike, "Variations Among Cities in Per Capita Income," *Journal of American Statistical Association*, September, 1937: E. L. Thorndike, *Your City*, (New York: Harcourt, Brace & Co., 1940: E. L. Thorndike, "The

(Footnote 2: Continued on page 433)

The factors which are to be correlated with electric use can be divided into three groups; namely, housing conditions, social characteristics and income. The first group includes the number of rooms per dwelling unit, per cent home owners, per cent apartment dwellers, "crowding" as expressed by persons per room, duration of occupancy and rent. The second group (social characteristics) contains the following measures: per cent foreigners, workers per family, per cent women working, infant mortality and high school attendance. The last group (incomes) consists of industrial wages, income taxpayers, new car sales and telephones, the latter two being regarded as indicators of income. In addition, electric use and gas use are correlated and also temperatures and refrigerator saturation. Besides these measures quite a number of others have been investigated for their possible effect on consumption. Some of these are discussed subsequently as being instructive in spite of their lack of correlation.

Data on Electric Use for Companies Serving the Cities

After the data for the 94 cities was assembled, the names of utility companies, gas as well as electric, serving in these cities and the population in their supply areas were obtained. In most cases the company supply areas extend beyond the cities' political boundaries, with the electric companies usually serving larger areas than gas companies. There are some instances where several cities with more than 100,000 population are located in the area of one company; sometimes two companies – often a municipal and a private company – are serving in one city. In those instances the data for the cities or the companies were weighted and combined. Cases where the city population constitutes only a small part of the total population served by the company were eliminated because the city for which the socio-economic factors are given would not be representative of the company for which the data on electric use are shown.

Further, if electric use is to be correlated with socio-economic factors in the cities, the saturation of electrified homes becomes of great importance. It stands to reason that one city which has only 70 per cent of its homes electrified may – other things being equal – show a higher electric use per consumer than another city which is 100 per cent electrified and includes families in the lowest economic levels. Therefore, saturation figures on electric homes were developed for the different cities using 1930 Census figures, 1934 Real Property Inventory data, and finally, the companies' reports to the Federal Power Commission which in one of their schedules asks for the number of consumers detailed for cities above 2,500. These figures were then used to adjust electric use and refrigerator saturations.

The average kilowatt hour use per consumer – the most commonly used measure of domestic electric use – was obtained for all the companies, also the average gas use, exclusive of house heating, adjusted for heat content. Besides, data on saturation of electric refrigerators, as far as reported, were collected.

After some preliminary experiments with the average per consumer electric use, the insufficiency of this measure (to be demonstrated subsequently) for the

(Footnote 2: Continued from page 432)
Influence of Disparity of Incomes on Welfare," *American Journal of Sociology*, July, 1938: E. L. Thorndike, "Variation and Correlation in Institutions, Activities, and the Personal Qualities of the Residents," *Annals New York Academy of Sciences*, December, 1939.

purpose of correlation with the various socio-economic factors and the need for a more refined instrument became apparent. This was found in the frequency distribution of domestic consumers by kilowatt-hour steps, sometimes called block analysis, which is reported to the Federal Power Commission by the electric utilities.

Frequency Distribution of Consumers by Kw-Hr Blocks

In the frequency distribution or block analysis the consumers are grouped by blocks or steps of kilowatt hours. The Federal Power Commission schedule calls for steps of 10 kw-hr up to 60, then of 20 kw-hr up to 100, then of 50 kw-hr up to 200, and of 100 kw-hr above 200. The actual number of consumers in each block can be expressed in per cent of the total number of consumers to facilitate comparisons between the frequency distributions of different companies. For many purposes the cumulative form, a progressive addition of the percentages of consumers in the different kilowatt-hour blocks, is more convenient. For instance, one can immediately determine from it the so-called median which is that amount of kilowatt-hours which divides the consumers into two equal parts, with one-half of them using less than the median and the other half using more.

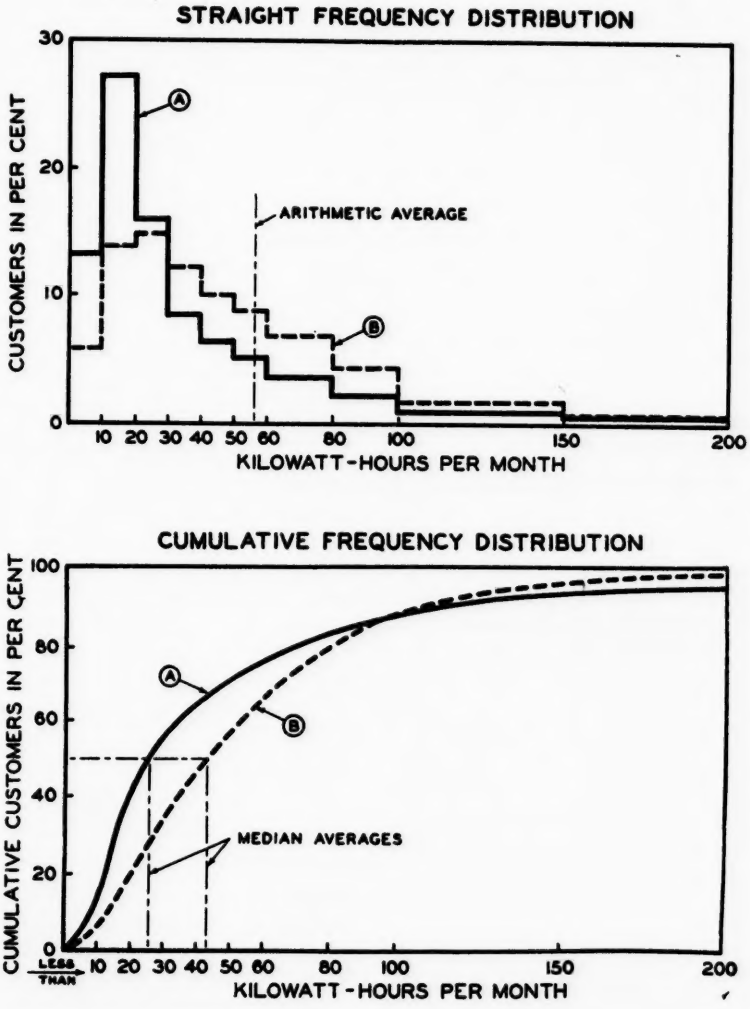
Insufficiency of the Average Kw-Hr Use per Consumer

The frequency distribution provides a means to demonstrate the insufficiency of the commonly used arithmetic average for the exploration of relationships between social and economic factors and electric use (Figure 1). Two companies, called A and B, are shown which have practically the same average monthly use per consumer; namely 57 and 56 kw-hrs. A glance at the frequency curves — shown in straight and cumulative form — reveals that the distributions of consumers in the two companies differ considerably. Company A has a large number of low use consumers, 40 per cent using less than 20 kw-hr, while Company B shows only 20 per cent with less than 20 kw-hrs. On the other hand, Company B has only 1.6 per cent of the consumers using more than 200 kw-hrs while A has more than 5 per cent of such consumers. Or to describe the two companies in terms of the arithmetic average use, Company A has 75 per cent of the consumers using less that this average while Company B has only 60 per cent. The median for Company A is 25 kw-hrs while for Company B it is 43 kw-hrs. Obviously, the social and economic conditions of the consumers which underly these frequency distributions show differences which the monthly average use entirely fails to express.

But the most serious shortcoming of the arithmetic average is the overemphasis it places on the heavy duty appliances. A 20 per cent range and a 10 per cent water heater saturation, for instance, would add nearly 500 kw-hr to the average use per consumer per year. But whatever may be the merits of these heavy duty appliances with respect to the operations of the utilities or in the eyes of the consumers; from the social point of view, electric cooking and water heating does not constitute a significant element in the standard of living as long as one can cook just as well and cheaply by gas—as is the case in the larger part of American communities—or as long as water can be heated just as conveniently and cheaply by other types of fuel. Conversely it is not so much the standard of living, i.e., economic and housing con-

FIG. 1

TWO FREQUENCY DISTRIBUTIONS
FOR THE SAME AVERAGE ELECTRIC USE



ditions,[3] which determine the extent to which electric heavy duty appliances are used in the different communities of the United States as the competitive price and availability of alternative fuel.

Median Kilowatt-Hour Use

Now, the median kilowatt-hour use which can be obtained from the frequency distribution eliminates or at least reduces the influence of consumers in the higher use brackets and thus more nearly expresses the use of a majority of the consumers. For none of the companies included in this investigation does the saturation of electric ranges or water heaters approach 50 per cent so that the median in all cases does not include any heavy duty appliance users. Besides, experience shows that in most cases the majority of electric ranges and water heaters are found beyond the gas mains and that means quite often outside the city limits. But since socio-economic data are given for the cities and electric use is given for the companies—usually supplying territories larger than the cities—there is an added reason to have a measure which minimizes the effect of heavy duty appliances.

However, not all the factors introduced in this study are correlated with the median use. There are some measures such as crowding, infant mortality and others which are indicators of a low standard of living, the effect of which should express itself more strongly in the lower part of the frequency distribution. Therefore, such measures are correlated with the percentages of consumers using less than 20 kw-hr, an amount which means scarcely more than a limited use of lighting, a radio and a flat iron and which, so to speak, represents an electric "subsistence level."

Various Socio-Economic Factors and Their Correlation with Expressions of Domestic Electric Use

When using correlations it should be kept in mind that correlation between two variables in itself by no means indicates causation; it is a logical process rather which determines the statistician's belief that there is causal relationship between two variables and his belief as to which is cause and which is effect. Thus, where causal relationship exists in the cases shown in the following, it was known or believed to exist before correlations were drawn. But absence of causal relationship between two variables does by no means imply that they should not be correlated. Several exhibits will be shown, where the two variables are both due to a common cause. An example is the correlation between telephone and refrigerator saturation, both of which obviously depend on income.

Housing Conditions

The first group of correlations shown here is that of housing conditions or daily living and electric use. The most prominent factor in this group is the number of rooms per dwelling unit, a factor which was recognized early as an important determinant of electric use. One of the most outstanding studies in this respect has been made by the West Penn Power Company.[4]

[3] Housing conditions conceivably may in some communities limit the ultimate development of electric water heaters, which depend almost exclusively on one and two family houses. But nowhere has such a limit even been approached. Nor is it implied that a community with more high incomes or more homes owned does not constitute a better market for electric ranges, but these factors are practically negligible at the present development of the range and water heater markets.

[4] *"Electric Light and Power,"* March, 1934.

The number of rooms per dwelling unit in itself may, of course, be affiliated with or be caused by a number of other economic or social factors. It may be, for instance, an expression of the income status of the population, with higher incomes enabling people to pay higher rents for more spacious quarters. Or, it may be a function of the size of a family. Or finally, it may be a reflection of the availability and the cost of land in the different cities.

We are, however, not so much concerned here to find the causes or conditions governing the number of rooms as we are with the relation between the statistically known measure, median number of rooms per dwelling unit, in the different cities, and a measure of electric use, because the number of rooms regardless of its causes puts a definite and physical limitation on electric use. This holds true quite clearly for lighting but it is also true as far as possession of appliances is concerned due to the lack of space in small quarters.

The correlation shown in Figure 2 is between median number of rooms and median kilowatt-hours. The trend, which like the trends for all the following charts is mathematically determined, indicates that the relation between the two measures is quite strong, electric use increasing in nearly the same proportion as the number of rooms.

When the number of rooms per dwelling unit is combined with the number of inhabitants per dwelling unit a new measure results, *persons per room*, which is an indication of crowding. Such a measure is of great social importance, excessive crowding being considered as a concomitant of poverty and a great social evil. The measure chosen here is the per cent of dwelling units with more than one person per room and it is correlated with the per cent of consumers using less than 20 kw-hr (Figure 3). It shows that cities which have more crowding also have a larger number of small users.

Another housing measure correlated with electric use is home ownership (Figure 4). This correlation is very pronounced and shows that home ownership is strongly associated with higher electric use. On the surface it may seem as if home ownership would exert its influence on electric use only through the medium of number of rooms. There is indeed a correlation between the two measures, that is, with a larger proportion of home ownership the median number of rooms becomes higher in the different cities, but this relationship does not exhaust the question of effect of home ownership on electric use. Many an appliance survey has revealed that certain appliances like washing machines and ironers are typical home-owner appliances, not to speak of electric ranges and water heaters. Nor is home ownership just another expression of income. In fact it has been found that income has only a slight influence upon it.[5] Thus, home ownership must be recognized as a factor affecting electric use independently of the number of rooms and income.

The next major measure of housing conditions, correlated with electric use, is per cent of apartment house dwellers (Figure 5). Apartments are defined as dwellings with more than two dwelling units. Thus the well-known three-decker typical of New England towns is included as well as the multiple family apartment house with several hundred units in New York City, covering therefore quite a wide range. It may

[5] E. L. Thorndike, "Variations Among Cities in Per Capita Income," *Journal of American Statistical Association*, September, 1937.

HOUSING CONDITIONS AND ELECTRIC USE

FIG. 2 ROOMS PER DWELLING UNIT AND RESIDENTIAL ELECTRIC USE

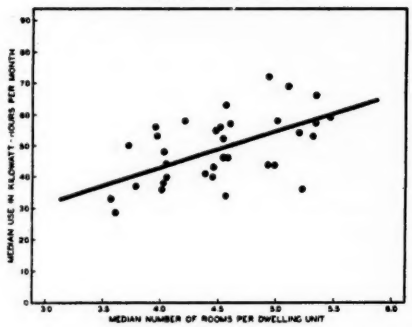


FIG. 3 CROWDING OF DWELLING UNITS AND LOW-USE RESIDENTIAL CUSTOMERS

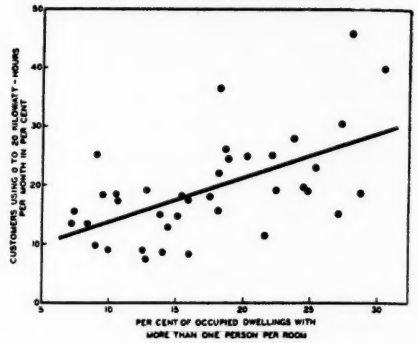


FIG. 4 HOME OWNERSHIP AND RESIDENTIAL ELECTRIC USE

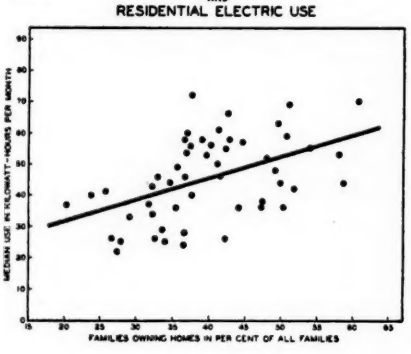


FIG. 5 FAMILIES IN APARTMENTS AND RESIDENTIAL ELECTRIC USE

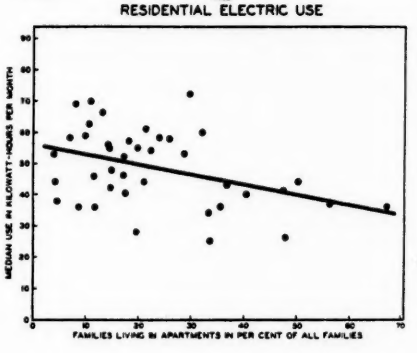


FIG. 6 DURATION OF OCCUPANCY AND LOW-USE RESIDENTIAL CUSTOMERS

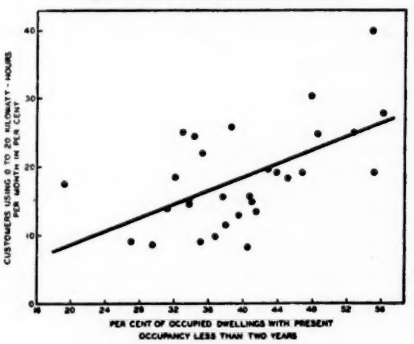
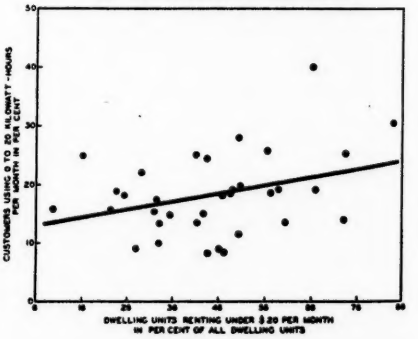


FIG. 7 RENTALS UNDER $20 PER MONTH AND LOW-USE RESIDENTIAL CUSTOMERS



appear that per cent apartment house dwellers is a complement to per cent home owners. This, however, is not the case because people renting a single family home or half of a two-family house are not included in either measure. Southern cities prove to be disturbing to the correlation between per cent apartment house dwellers and median electric use because in these cities the colored population in the low income levels does not live in multi-family tenements but rather in rented single family shacks. Thus southern cities show comparatively low percentages for families living in apartments and at the same time low electric use. For this reason they were eliminated from the correlation which for all other cities shows a declining use with an increasing percentage of apartment house dwellers. Similarly, as in the case of home owners, the percentage of apartment house dwellers acts on electric use through the number of rooms, but what holds true there also holds true here; namely, as home ownership stimulates electric appliance ownership so apartment living is putting definite limitations on electric use quite independently of the number of rooms. To see this, one has only to compare the load building possibilities in a five-room apartment with those for a five-room house.

A further measure in the group of housing conditions is the duration of occupancy of less than two years. This measure which applies to all quarters, rented as well as owned, reflects the ratio of renters to owners, with rented quarters showing shorter duration of occupancy. But there is the possibility that two cities having the same ratio of rented to owned quarters still would show different mobility. Greater mobility as expressed by the proportion of homes occupied by their present occupants less than two years is certainly not very conducive to appliance ownership. The correlation in Figure 6 indicates that the higher the per cent of dwellings with a duration of occupancy of less than two years the higher the percentage of consumers using less than 20 kw-hrs.

The last measure belonging to the group of housing conditions to be correlated with electric use is the per cent of dwelling units renting for less than $20. (Figure 7.) This measure, in spite of the fact that it is unadjusted for differences in purchasing power of the rent dollar in the various cities is important as an indication of low standard housing, associated with low income levels. It is correlated with per cent of consumers using less than 20 kw-hrs as an expression of low electric use. The chart demonstrates that low electric use is associated with low rents.

Social Characteristics

The second group of measures whose affiliations with electric use are explored are those classified as social characteristics or population traits.

Various studies made in metropolitan areas with large foreign born populations have revealed a tendency for lower electric use among these groups. This cannot be ascribed exclusively to their usually lower income status, but must be due to psychological traits which make them more reluctant to adapt themselves to the more mechanical amenities of modern American life. Southern cities have been eliminated because of their large negro populations which, though native American, are either low users or do not use electricity at all. The correlation (Figure 8) shows lower electric use with higher percentages of families whose heads are foreign born.

SOCIAL CHARACTERISTICS AND ELECTRIC USE

FIG. 8 FOREIGN-BORN POPULATION AND RESIDENTIAL ELECTRIC USE

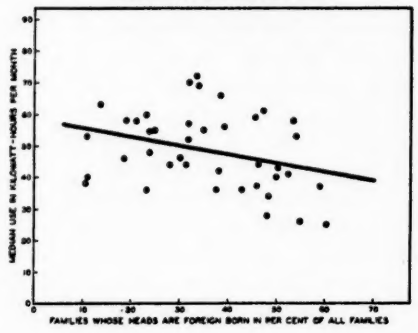


FIG. 9 THREE OR MORE WORKERS PER FAMILY AND RESIDENTIAL ELECTRIC USE

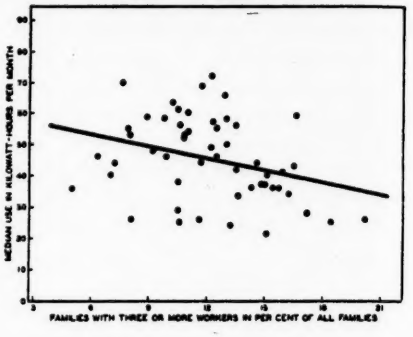


FIG. 10 WOMEN GAINFULLY OCCUPIED AND RESIDENTIAL ELECTRIC USE

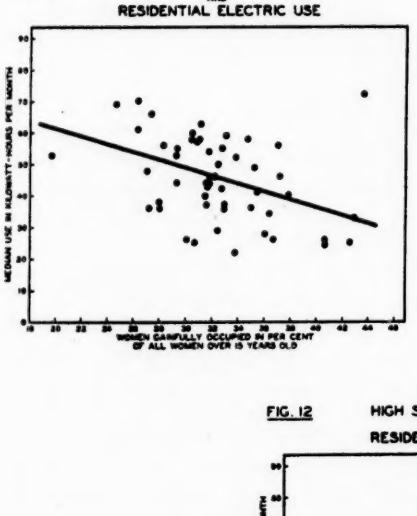


FIG. 11 INFANT MORTALITY AND LOW-USE RESIDENTIAL CUSTOMERS

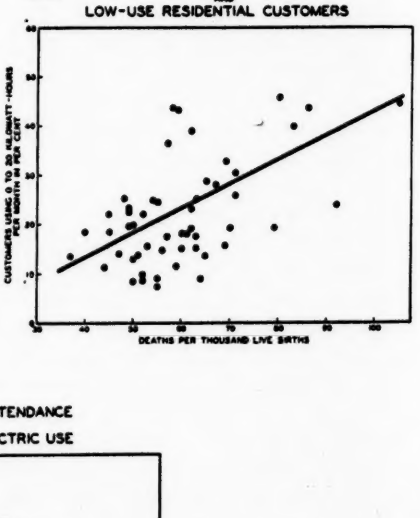
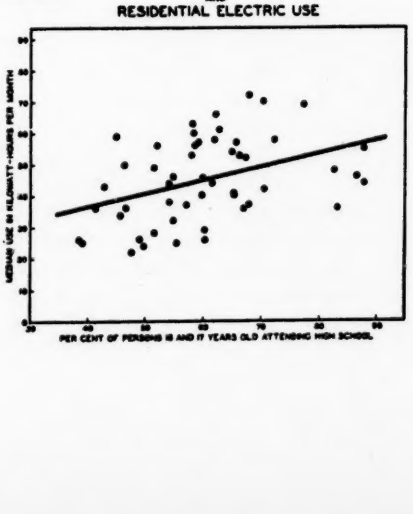


FIG. 12 HIGH SCHOOL ATTENDANCE AND RESIDENTIAL ELECTRIC USE



As mentioned above, a correlation between number of persons per family proves unsuccessful, due to the fact that the bulk of the values ranges only from 3.8 to 4.2. The same holds true for persons gainfully occupied per family, in which case the majority of the points falls between 1.65 and 1.90.

Two other measures, however, which are related to the number of persons gainfully occupied per family: namely, per cent families with three or more workers and women gainfully occupied in per cent of all women, correlated well with electric use. Both measures indicate a situation where the income of the chief breadwinner is not sufficient or stable enough to support the family and where supplementary income is needed. But the absence of two additional persons from home, or the going to work of the housewife and other female members of the family, is restricting home life to a considerable extent and depresses electric use, as Figures 9 and 10 show quite clearly.

In Figure 11, infant mortality is correlated with the percentage of consumers using less than 20 kw-hrs. High infant mortality is concomitant with a low standard of living and poverty. It is not surprising to see it vary along with the percentage of low-use consumers.

The last measure in this group is high school attendance in per cent of all persons 16 and 17 years old. As in the case of infant mortality, there is no causal relation between high school attendance and electric use. But high school attendance is rather an expression of greater well-being or a higher economic status of the population. In addition, it probably also means a higher cultural level which may have a considerable influence on the use of electricity. The correlation is between high school attendance and median use (Figure 12). The trend is upward with larger high school attendance paired with higher electric use.

Income

Income is recognized as one of the chief determinants of electric use. Its prominence among the many factors has been amply stated in the literature on domestic use.[6] The relation between income or purchasing power and electric use operates not so much through the price of electricity, as through the purchase of the means of utilization of electric energy. This is illustrated by the fact that the existing investment—at reproduction cost—in electric household appliances in 1937, without wiring costs, amounted to about $5,500,000,000, and that the expenditures for utilization equipment in this one year were $1,310,000,000, while the cost of electric service amounted to $780,000,000.

To investigate the relationship between income and electric use, the ideal measurement, of course, would be the median income for the different cities which presupposes a frequency distribution. However, such income distributions as are available at present do not cover the whole range of incomes, from millionaire to relief recipient, nor are they given for a sufficient number of cities. Because of lack of true and perfect measurements of income one has to resort to indicators or symptoms of income which themselves may be dependent upon other features of a city than income of its residents, or one must choose measures which represent only part of the income, such as wages of industrial wage earners, or per cent of federal income taxpayers.

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[6] S. M. Hall, "Rent and Income Fix Appliance Markets," *Electrical World*, November, 1936.

INCOME AND ELECTRIC USE

FIG. 13 INDUSTRIAL WAGES AND RESIDENTIAL ELECTRIC USE

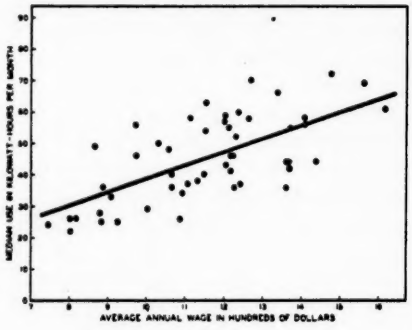


FIG. 14 INCOME TAX PAYERS AND RESIDENTIAL ELECTRIC USE

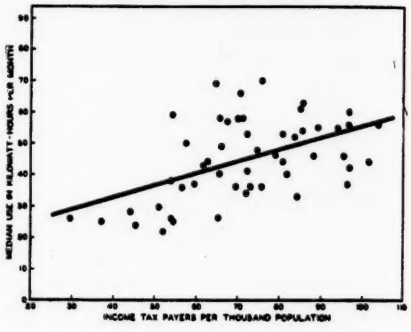


FIG. 15 NEW CAR SALES AND ELECTRIC REFRIGERATOR SATURATION

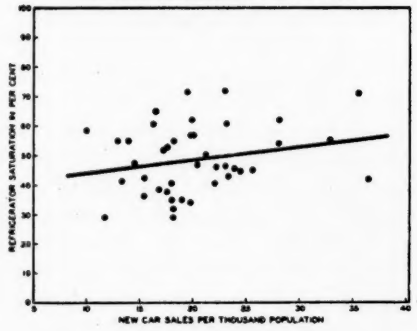
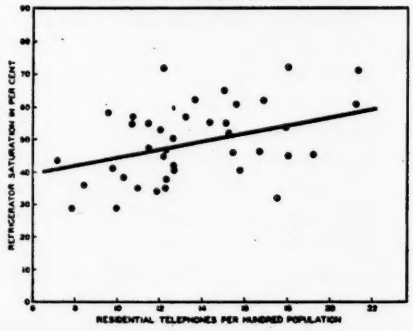


FIG. 16 RESIDENTIAL TELEPHONES AND ELECTRIC REFRIGERATOR SATURATION



When industrial wages are correlated with median electric use (Figure 13) a fairly strong correlation results clearly demonstrating that higher electric use is associated with higher wage incomes. The fact that in the cities studied the percentages of all wage earners employed in industry may vary is probably of small consequence because industrial wages are usually representative of wage levels in general. Of course, these wages are dollar wages and not real wages; that is, no allowance is made for difference in value of money or purchasing power. Adjustments are not made because cost of living data are available for only a small number of the cities used here. However, the range in the cost of living between the lowest and highest city is not more than 20 per cent, while the range of wages is 100 per cent, so that any adjustment of wages for the cost of living would alter the picture very little.

Another indicator of income is the number of federal income tax returns per thousand of population which, quite in contrast to industrial wages, is a measure of the higher income levels. The correlation between it and median electric use (Figure 14) shows that there is a correspondence between the two measures. It is interesting to note that W. J. Crowley and C. H. Baily in their article, "The Relation of Electricity Consumption to Purchasing Power," have found income tax returns the most satisfactory indicator of purchasing power. Also W. M. Persons in his article, "Influence of Climate and Rates on Electric Refrigerator Sales," successfully correlates this measure with refrigerator saturation.

Residential telephones and automobiles are frequently compared with electric appliance saturation, particularly refrigerators, since they can be regarded as the most outstanding indicators of the American standard of living. When dealing with statistics on automobile ownership, it was found that passenger car registration in the various cities is not a good indicator of income due to the inclusion of used cars. Correlation between car registration and electric use does not turn out to be very successful. However, when new car sales were used the correlation improved.

Instead of showing the correlation of new car sales and residential telephones with residential electric use, the correlations between these two measures and electric refrigerator saturation are used (Figures 15 and 16) because they are somewhat better. That refrigerator ownership should increase with new car sales as well as with telephones should be expected as all are governed by income.

Miscellaneous Correlations[7]

Following W. M. Persons' study on the influence of temperature on refrigerator saturation for the 48 states, it was decided to investigate this influence for the cities with more than 100,000 population. The findings coincide with Persons' conclusions that with increasing normal July temperatures refrigerator saturation increases (Figure 17). There are two trends shown in this chart: one for all cities, another one—much steeper —exclusive of southern cities. It will

[7] Other factors which have been correlated with domestic electric use are: Average value of homes, city taxes per capita, assessments per capita and retail sales per capita. None of these correlations proved successful. Value of homes, besides being based on the 1930 Census, could not be expected to correlate well because of the varying proportions of families owning homes in the different cities. City taxes and assessments are probably too much affected by differences in the efficiency of city administrations and the inclusion of industrial and commercial properties in assessment values. Retail sales per capita, another item investigated, also proved unsuccessful, probably because of purchases made by non-residents.

be remembered that the values for refrigerator saturation have been adjusted for unwired homes—a necessity if the figures are to have any meaning in exploring socio-economic causes of electric use in different cities. This, however, emphasizes the lower social and economic status of most of the southern cities which counteracts the effect of temperature on refrigerators; hence the lower trend when the southern cities—designated by open dots—are included.

The last correlation (Figure 18) is between gas and electric consumption. W. J. Crowley and C. H. Baily have observed, in their study of Illinois communities, a close correlation between gas and electric use. This may at first seem paradoxical in view of the fact that gas and electricity are competitive in respect to cooking, water heating and refrigeration; but the use of the median electric kilowatt-hour consumption in this study eliminates the effect of electric cooking and water heating, whereas, as far as the average gas consumption is concerned, the changing of a number of gas consumers to electric cooking would not affect the average gas consumption to any appreciable extent. House heating consumption is not included in the gas figures employed here. The correlation permits the inference that if gas and electric consumption—below the zone of actual displacement of one by the other—vary together in the different cities, regardless of rate levels, there must be a common cause, namely, the economic situation which is acting simultaneously on both.

Critique

The results of this study having been presented, we shall now try to appraise them. First of all, certain limitations and shortcomings of the basic statistical material must be pointed out. The lack of complete coincidence between city area and company supply territory in many cases represents one of the major defects in the correlations and part of the scatter of the points about the trend line must be ascribed to this condition. Next is the lack of up-to-date data. Whereas company statistics are all for the year 1938, this is not the case with the various socio-economic factors. A large part of them originates from the

FIG. 17 TEMPERATURE AND ELECTRIC REFRIGERATOR SATURATION

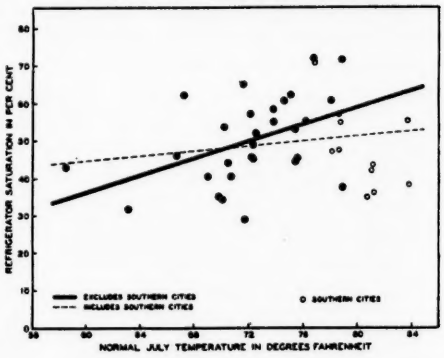
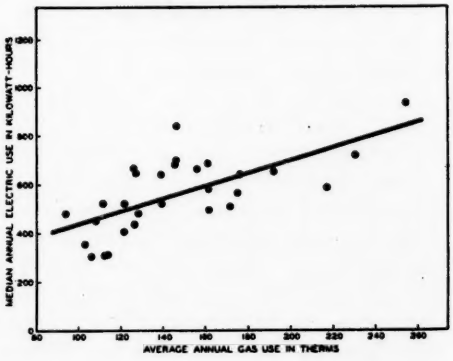


FIG. 18 RESIDENTIAL GAS USE AND RESIDENTIAL ELECTRIC USE



1930 census of population, for instance, social characteristics and some of the housing conditions. Several of the latter originate in the 1934 Real Property Inventory, such as number of rooms, crowding and duration of occupancy. Industrial wages and income taxpayers are for the year 1937, while only new car sales and telephones are for 1938.

But the presence of these inadequacies in the statistical material enhances the effectiveness of the evidence produced rather than diminishes it.

It will be remembered that for eight of the seventeen measures which were correlated in the foregoing, the correlation with electric use did not represent causal relationship. They are duration of occupancy, crowding, low rent, infant mortality, high school attendance, new car sales, telephones and gas use. Seven of these are themselves caused more or less by income, while short duration of occupancy is a characteristic of apartment house living.

Why then have these measures been introduced at all? First of all, some of them — like high school attendance and infant mortality—have elements other than income in them, i.e. characteristics of the personnel which are more of a cultural or racial than of an economic type. Second, by bringing in these additional measures the possibility of chance correlations—a danger always present where correlations are used—is eliminated and thus the evidence is strengthened.

Now, the statistical appraisal of the results: The trends for all the correlations shown have been mathematically calculated by the method of least squares. The coefficients of correlation which are a measurement of the dispersion of the points and the steepness of the trend, have also been calculated and were found to range from 30 per cent to 70 per cent, with 100 per cent representing perfect correlation. About this rather intricate statistical measurement it should be said that, depending on the size of the sample, even a 20 per cent correlation can be significant.

In our case the size of the sample is always considerable. Starting out with 94 cities above 100,000 population, the smallest number of points in any correlation is 30, with 52 the highest, the loss of the other points being caused by nonavailability of data or elimination due to lack of coincidence of city and utility territory. On this score the significance of the results cannot be doubted.

There are, however, other considerations. It must be realized that electric domestic use is a product of many various factors without any particular factor being dominant; even in the socio-economic sector, which is only one of the several which should be considered, the individual measures introduced in the foregoing should be visualized as acting together. Their effect, however, is not always cumulative. They may sometimes counteract or even cancel each other. It may be, for instance, that for one city the number of rooms is low while industrial wages are high, the first tending to lower, the second tending to raise consumption.[8] This, of course, is responsible for most of the dispersion of the points about the trend, in addition to that caused by the shortcomings of the data, as described above. Under these conditions a perfect correlation cannot be expected.

Conclusions

To sum up the results, we may focus

[8] There is a statistical means for combining several factors; namely, multiple correlation. However, with a great number of factors the operations become very lengthy. Using three factors it was possible to obtain a coefficient of correlation higher than that of any of the components.

attention on six correlations which stand out as particularly significant among the seventeen shown. Two of them, number of rooms and home ownership, emphasize the strong influence of housing conditions on intercity variations of electric use. Two others, foreign born and women working, bring out the effect of social characteristics and, finally, the last two, industrial wages and income taxpayers, demonstrate the importance of income. Reviewing these three pairs of measures, we become aware of the fact that the three groups mentioned here constitute three subdivisions of the social and economic sector which are relatively independent of each other and that they are fundamental in their effect on electric use.

The fact that the various socio-economic factors can be successfully correlated with residential electric use in the larger cities of the United States in spite of wide variations in rates and presumably in promotional efforts on the part of the companies, attests to the important part played by these factors in the residential demand for electricity.

This does not mean that rates, the most widely discussed determinant of electric use, are ruled out, but it does mean that the so-called "elasticity of the residential demand for electricity" (the relationship between unit price and the quantity of electricity) is far from sufficient to explain the variations in residential use in the larger cities of the United States.

Facts such as that two cities with widely different rates have the same electric use, or that two cities with similar rates have widely different uses—and such examples are easily found—cannot be explained without the effect of differences in number of rooms, in home ownership, in population characteristics or in income.

(The author wishes to give acknowledgment to the following members of the Survey Division of the Bureau of Economic Research who have assisted in the collection, compilation and analysis of the material contained in this paper and in the presentation and discussion of the results: Messrs. Abrahamson, Dettman, Diehl, Johnson, Pagella, Plant, Scheerer, and Zanotti.)

Cotton Allotments in the Mississippi Delta New-Ground Area

By JOHN E. MASON *

Introduction

MORE than twenty thousand families have moved into the cut-over woodlands of the Mississippi River Alluvial Plain since 1930. From a veritable wilderness of brush, stumps and trees these people are clearing and developing small farms alongside the large cotton plantations. The poorly drained wooded lowlands of Louisiana, Mississippi, Arkansas and Missouri form a new agricultural frontier, a frontier where new settlers are confronted with a host of difficulties. Land prices and interest rates are high; purchase terms often are unfavorable; drainage is poor; roads are yet to be built and schools provided; credit for clearing the land, erecting improvements, and operating the farm is not easy to obtain; and, in addition, new settlers have a problem of, as they express it, "not enough cotton." [1]

Many long-established plantation operators are also clearing additional land and running into similar difficulties. Plantation operators not clearing land feel the economic impact from the nearby land development of their neighbor plantation, and the family-size operators.

Settlement has been taking place rapidly on the cut-over lands and is continuing even under conditions of war and rapid expansion of industrial employment. The new settlers have not had industrial experience but are from farms primarily; and so they are not being absorbed by the war industries in large numbers though a few are finding nonfarm work. Public agencies need to be utilized to guide this settlement.

In spite of discouraging prospects with respect to cotton, this is the crop on which the new settlers rely largely for a cash income. Farmers are being encouraged to plant up to their allotments, but large increases in total cotton production cannot be justified at this time. It would seem, therefore, that major adjustments between cotton producing areas may be necessary, and these adjustments must be made in such manner that large groups of people do not suffer from the consequences. The basis for shifting allotments between areas is a problem needing detailed study.

A hungry man without a home and without a job is a social problem and the nation can afford to assist him in the development of farms if such lands are well-suited to agriculture. Society has a moral obligation toward many of the new-ground farmers, because society has been partially responsible for their dislocation. The need for some means to

* Agricultural Economist, Agricultural Adjustment Agency, U. S. Department of Agriculture.

(This article was prepared while the author was on the staff of the Bureau of Agricultural Economics. In its final preparation he received many helpful suggestions from A. C. Smith, Assistant Administrative Officer, and Ralph May, Statistician, Louisiana State Office of the Agricultural Adjustment Administration. Any error of interpretation is the responsibility of the author.)

[1] Cf., Phillip E. Jones, John E. Mason, Joseph T. Elvove, "New Settlement in the Delta of the Lower Mississippi Valley," *The Journal of Land & Public Utility Economics*, November, 1941, pp. 465-76.

recompense the new-ground farmer for handicaps not of his own making is one of the foremost questions in the Delta. One of the first concerns is the people, especially farm people at the bottom of the economic pyramid desperately seeking security on the fertile land.

It must be emphasized that any attack by public agencies on the problems of land settlement will be tempered by many variables and the complete solution cannot be found in the Delta area alone nor even within the province of agriculture for the nation as a whole. The movements of population, the dislocations caused by war activities, the backing up of surplus families on the land, the return of urban unemployed to farms, the displacement of farm families by farm machinery, restricted foreign markets, and land purchase for reservoirs and other purposes are different aspects of the whole problem of rural adjustment in the Delta and in the entire nation.

This article does not decide the responsibility for the displaced farm families. For the past several years thousands of these families have found a refuge on the cut-over land, and agriculture has borne the burden. Agriculture is still helping these people. At present, war industries are taking up some of the slack, thereby lessening pressure on the land. When the war is won by the United Nations, thousands of men will be looking for peace-time occupations. Will industry or agriculture be responsible? Neither, alone, but the nation, united. Government, industry and agriculture working together must keep the workers employed in peacetime, or else additional thousands will seek a haven on the land when the war ends. The rate of settlement and pressure for land is great even now.

This article deals with cotton acreage adjustments and how the program affects the new-ground farmers and long-established plantation operators in the areas of new land development. Certain policies and programs relevant to the development of new lands in the Alluvial Valley of the Mississippi River are outlined briefly. Some of the suggestions will require new or amended legislation before any action can be taken. The United States Department of Agriculture and cooperating state and federal agencies are vitally concerned with the problems resulting from new land settlement, of which cotton acreage allotments is one of the most important. This article is intended to direct attention to some of the problems and to provoke thought and discussion of some possible methods of alleviating them. It does not necessarily advocate any particular solution; neither should it be construed as a plea for any group of farmers. Debatable issues are purposely presented.

The New-Ground Farmer and the Cotton Program

Aside from the physical difficulties in establishing a farm in a woodland area, the new settler faces serious difficulties in securing a cotton acreage allotment large enough to produce an income adequate for minimum living expenses, for payments on land and for other farm expenses. The Agricultural Adjustment Act of 1938, as amended, limits the cotton acreage on any farm to the highest cotton acreage planted plus that diverted in any of the past three years. Because land clearing and the establishment of improvements is a slow and difficult process, most new settlers get only a few acres cleared for crops their first year. They usually plant as much of this acreage as possible in cotton and this acre-

age becomes their highest planted in any of the past three years no matter how long they continue to grow cotton, if such settlers participate each year in the cotton program. Thus, many new settlers are now limited to 3 to 6 acres of cotton, although they may now have 25 acres or more of good farmland cleared and in cultivation.

TABLE I. NUMBER OF NEW FARMS PERMITTED COTTON ACREAGE ALLOTMENT IN 1941 AND NUMBER OVERPLANTING THE ALLOTMENT, NORTHEASTERN LOUISIANA DELTA PARISHES.

Parish	Number of Farms	
	Receiving acreage	allotment Overplanting
Catahoula	18	0
Concordia	36	15
East Carroll	30	13
Franklin	38	8
Madison	46	28
Morehouse	38	5
Richland	27	6
Tensas	24	10
West Carroll	72	30
Total	329	115

The 1941 program had a state acreage reserve of one per cent to be apportioned to farms on which cotton was planted in 1941, for the first time since January 1, 1938. One per cent was also set aside for new farms in 1942. The total amount for new farms being limited to one per cent rather than two per cent, as in previous years, did not create an insurmountable difficulty for those new farmers planting cotton for the first time in the Delta in 1941; but other restrictions on making the individual farm allotment may have had the effect of encouraging new-ground farmers (as distinguished from "new producers" on established farms) to overplant their cotton acreage allotment intentionally, thereby increasing rather than decreasing total cotton production on new-ground farms (Table I). The present regulations, based upon recommendations of farmer representatives, provide that cotton acreages permitted for new farms,

"shall not exceed an acreage equal to 50 per cent of the county cotton factor . . . times the adjusted tilled acreage in the farm, except that for any such farm with respect to which the county committee's recommendation of a permitted acreage is less than 5 acres, such recommendation shall be the cotton permitted acreage for the farm if the State reserve for new farms is sufficient therefor, or for any such farm with respect to which the county committee's recommendation of a permitted acreage is 5 acres or more, the permitted acreage for the farm shall not be less than 5 acres if the State reserve for new farms is sufficient therefor . . ." [2]

This means that if a farmer desired to plant cotton for the first time in 1941 or 1942 on a 40-acre farm with 30 acres cleared in a county where the cotton factor (percentage of cropland permitted in cotton) was 40 per cent, the cotton allotment was not more than 6 acres (20 per cent of 30 acres). These hypothetical figures are as favorable as can be expected in the average new-ground areas of the Delta. As a matter of fact, data in the farm management section of the Mississippi Backwater Areas Study [3] show that the average new-ground farmer usually clears only 10 acres for his first crop.

Several new-ground farmers planting cotton for the first time in 1941 expected to gain in the long run by intentionally overplanting their cotton acreage allotments, even though they were penalized for cotton marketed in excess of their

[2] *1941 Agricultural Conservation Program Bulletin*, Agricultural Adjustment Administration, U. S. D. A., December 9, 1940, p. 7. For 1942 the 5-acre figure has been reduced to 3 acres.

[3] *Mississippi Backwater Areas Study — Yazoo Segment.* U. S. Department of Agriculture. (Processed), 1941.

marketing quotas and did not receive the payment of 1.37 cents for each pound of the normal yield for each acre in the cotton allotment. In 1941, this payment (1.37 cents per pound) was not allowed for farms on which cotton was planted for the first time since January 1, 1938. Previously new producers who did not intentionally overplant were eligible for this payment as well as the soil-building assistance. They are still eligible for the latter. A Louisiana study [4] has shown that new producers can afford to pay a penalty of 3 cents per pound and lose payments in order to establish a larger cotton acreage allotment. However, the penalty for 1941 and 1942 is much higher than 3 cents per pound. It is now 50 per cent of the basic rate of the loan to cooperators or about 8 cents per pound. But since the price of cotton is also much higher now than in 1940 and earlier years, it may still be profitable for a new-ground farmer to remain out of the program to build up his allotment.

TABLE II. PERCENTAGE OF CROPLAND IN COTTON IN SELECTED DELTA COUNTIES 1938-42 [a]

State and County	1938	1939	1940	1941	1942
	Per cent	Per cent	Per cent	Per cent	Per cent
Arkansas					
Chicot	35.88	37.48	35.45	33.11	31.95
Desha	36.99	37.25	34.41	33.54	32.94
Lee	38.30	38.78	37.02	33.73	32.62
Phillips	40.95	39.74	36.56	35.03	34.09
Poinsett (Delta area)	39.89	37.71	33.05	32.96	31.59
Louisiana					
Concordia	37.00	34.81	32.97	32.96	32.55
East Carroll	39.94	37.95	38.61	36.89	35.28
Madison	31.81	30.29	31.11	30.46	30.74
Tensas	37.95	35.75	33.16	32.78	32.75
West Carroll	39.70	31.67	33.24	33.39	31.92
Mississippi					
Humphreys	45.88	43.82	42.16	40.17	39.82
Issaquena	40.49	39.76	38.60	37.40	35.80
Sharkey	41.49	41.95	39.98	38.32	37.16
Sunflower	48.02	46.74	46.23	45.65	45.30
Washington	41.90	40.68	40.35	39.46	38.49

(a) Late applications and reconstituted forms not included.

Many new-ground farmers learned too late that they could not participate in the cotton program and increase their cotton acreages as more land was cleared. Consequently, they overplanted in their second or third year in order to build up their allotments. Prospective settlers should be informed of these features of the cotton program to prevent misunderstandings. It is almost imperative that this burden be assumed by the employees of the federal, state and local governments concerned.

The Established Farmer and the Cotton Program

Thus far, county acreage allotments in the Delta new settlement areas have remained rather constant or increased only slightly from year to year and any increase in acreage allotted to new farms has resulted in a corresponding decrease on old farms (except that established farms receive a minimum allotment of 50 per cent of the 1937 planted and diverted acreage unless this is more than 40 per cent of the cropland). This situation is shown by the gradual decline in the percentage of cropland allotted to cotton (Table II). It will be noted that the percentage has dropped in some Delta counties by as much as 8 points. For example, West Carroll Parish, Louisiana shows a decline from 39.70 per cent in 1938 to 31.92 per cent in 1942. In other words, the cotton acreage allotted to farms in that parish, having the same amount of cropland in 1942 as in 1938,

[4] Phillip E. Jones, John E. Mason, and Joseph T. Elvove, *New Settlement Problems in the Northeastern Louisiana Delta*, Louisiana Agricultural Experiment Station and Bureau of Agricultural Economics cooperating, (Mimeographed) July, 1940; also same authors and title, Louisiana Bulletin No. 335, February, 1942.

has been reduced by 19.6 per cent over the 5-year period, except where this would result in an allotment of less than 50 per cent of the 1937 planted and diverted acreage. Established farmers in other Delta counties having considerable new settlement have suffered a similar though less severe decrease in the acreage permitted in cotton. It should be pointed out that this decline is the result of the addition of new cropland by established plantations, by the development of entirely new plantations from cut-over lands, by reclassification of cropland on established farms, and by state and county readjustments in some instances, as well as by the clearing and development of small, family-sized farms.

Several entirely new plantations have been developed in the Delta during the past ten years. Thus, large operators, long-established and relatively recent ones, are caught in a vicious circle partly of their own making. In fact, the large operators have brought into cultivation much of the new land cleared during the last decade. In Louisiana 22 per cent of the 17,000 acres cleared in East Carroll Parish between 1930 and 1940 were brought into cultivation by large operators.[5]

As the percentage of cropland allotted to cotton declines, the established plantation operators with undeveloped land begin clearing it in order that they may continue to plant approximately the same total number of acres to cotton. They may even increase their total cotton acreage, but seldom add new families to the plantation (Table IV).

A hypothetical case can be used to illustrate the clearing operations of established plantations. Plantations "A" and "B", each containing 1,000 acres, with 400 acres of the 600 acres of cropland in cotton in 1937, are used as examples.

[5] Jones, Mason, and Elvove, *op. cit.*

TABLE III. PERCENTAGE OF CROPLAND IN COTTON IN SELECTED UPLAND COUNTIES, 1938-1942 [a]

State and County	1938	1939	1940	1941	1942
	Per cent	Per cent	Per cent	Per cent	Per cent
Arkansas					
Baxter	12.53	12.91	11.69	12.45	13.55
Crawford	25.45	25.23	25.62	25.65	27.17
Newton	11.91	12.91	13.21	14.21	13.87
Searcy	10.95	10.24	12.46	12.19	13.92
Union	26.26	28.53	29.10	28.57	29.07
Louisiana					
Grant	25.60	24.76	28.57	28.24	29.25
Jackson	26.50	28.08	28.33	30.18	31.34
LaSalle	29.66	28.64	29.20	29.69	30.21
Sabine	25.69	26.18	26.49	30.20	33.89
Winn	25.31	29.16	29.59	29.80	31.55
Mississippi					
Attala	25.34	23.60	25.12	27.90	27.02
Jasper	26.31	27.42	28.27	28.35	28.91
Simpson	26.45	28.19	30.09	30.76	30.39
Tippah	26.33	29.62	31.48	31.53	30.16
Union	27.31	30.12	29.31	29.39	29.75

[a] Late applications and reconstituted farms not included.

Favorable crops and good prices for cotton may have encouraged the operator of plantation "A" to start clearing more land, but the cotton adjustment program gave an added impetus in 1938 and subsequent years. The operator of plantation "A", desirous of planting approximately 300 acres of cotton each year, found it necessary to clear more land every year, because of the yearly decline in the percentage of cropland permitted to be planted to cotton under the agricultural conservation program (Table IV). By clearing 309 acres since 1937 the operator of plantation "A" has been able to keep all of his cropper families without reducing their cotton acreage. On the other hand, the operator of plantation "B" has not cleared new land and has been allotted fewer acres for cotton each year and has found it necessary to reduce the number of cropper families from 38 to 24 (or divide fewer total acres among them, thus reducing their standard of living). The reduction of cotton acreage will not continue indefinitely on

plantation "B" because the law provides that no allotment shall be less than 50 per cent of the 1937 planted and diverted acreage, unless this acreage would be more than 40 per cent of the cropland involved.

In the upland section adjacent to the Alluvial Plain, farmers have found it possible to increase the percentage of cropland in cotton since 1938. (The increase is due in part to reclassification of cropland and does not necessarily mean that all farmers can increase cotton acreages in the proportions indicated in Table III.) Consequently, new settlers and long-established farm operators in the Delta contend that cotton acreage should be transferred from upland to Delta areas. In support of this argument they point out, for example, that in Winn Parish (an upland parish), Louisiana, farmers could plant 25.31 per cent of their cropland in cotton in 1938, but in 1942 they will be permitted to increase their cotton acreage to 31.55 per cent of their cropland. Total acreages allotted to upland counties have not increased; in fact, total county allotments have decreased in some upland counties. Nevertheless, some farm allotments in such upland counties have increased. Insofar as individual farms have any advantage in the production of cotton there can be no economic objection to this situation. The welfare of all the people must always be kept in mind—no matter whether they live in the hills or in the Alluvial Valley of the Mississippi River.

Although the county acreage allotments have appeared to local producers to remain unchanged from year to year, some increases have been made in those counties where large acreages of new lands have been brought into cotton production. These increases have come from a special state reserve. The Agricultural Adjustment Act provides for

TABLE IV. HYPOTHETICAL DATA ILLUSTRATING ONE REASON FOR EXPANSION OF PLANTATIONS UNDER THE AGRICULTURAL CONSERVATION PROGRAM *

Year and Plantation	Total land in			County factor	Cropper families	Land cleared to keep constant cotton acreage
	Plantation	Crops	Cotton			
1937	Acres	Acres	Acres	Per cent	Number	Acres
Plantation A	1,000	600	400	.....	38	.....
Plantation B	1,000	600	400	.....	38	.....
1938						
Plantation A	1,000	750	300	40	38	150
Plantation B	1,000	600	240	40	30	.....
1939						
Plantation A	1,000	789	300	38	38	39
Plantation B	1,000	600	228	38	29	.....
1940						
Plantation A	1,000	833	300	36	38	44
Plantation B	1,000	600	216	36	27	.....
1941						
Plantation A	1,000	857	300	35	38	24
Plantation B	1,000	600	210	35	26	.....
1942						
Plantation A	1,000	909	300	33	38	52
Plantation B	1,000	600	200	33	24	.....

(*) It is assumed that plantations "A" and "B" are identical at the beginning of the 1937 crop season.

the proration of the state acreage allotments among the counties on the basis of the sum of the acreage planted to cotton plus the acreage diverted from cotton in each county during the preceding five years. Under this method the county percentages of the total would be increased slightly from year to year where new farms are being developed rapidly, except for the fact that another provision of the Agricultural Adjustment Act sets up a basis for a minimum allotment to all cotton producing counties. This minimum of 60 per cent of the sum of the acreage planted to cotton plus that diverted from cotton production in 1937 has served to prevent shifts from upland to Delta counties.

The Agricultural Adjustment Administration has recently attempted to remedy this particular situation in the cotton acreage allotment program. A provision in the 1941 program allows for the apportionment to counties of a part of the four per cent reserve "where farm allotments have been substantially reduced because of new farms coming into the production of cotton in 1938, 1939 and 1940." This is a step toward one of the fourfold objectives of local, state and federal planning for agriculture, namely, "adaptation of national policies and programs to varying local conditions and to local problems".[6] Though not perfect from the individual standpoint of all producers, this provision (continued in 1942) will tend to prevent an undue reduction in farm acreage allotments of established producers who would otherwise be affected by new farms coming into production of cotton.

[6] Report of the Secretary of Agriculture, 1939, p. 75.

Some Policies and Programs Relevant to Development of New Lands in the Delta

There is a difference of opinion concerning the desirability of encouraging settlement and development of the cut-over Delta lands, even where such lands will produce high yields of crops commonly grown in the area. Some people take the position that the opening of new agricultural lands and the planting of additional thousands of acres to cotton will result in further complicating the surplus problem of this commodity, and hence they would not encourage such a movement. Others see in the development an opportunity to shift the production of cotton from poor upland areas to fertile Delta lands. One group argues that the settlement now taking place on new lands in the Delta is a natural result of production and price control measures and will continue only so long as such measures are in effect. On the other hand, another group takes the position that the settlement is a manifestation of the pressure of surplus farm people on the resources of the nation and that the opening of new lands is inevitable. Regardless of the differences of opinion on these questions, economists, sociologists, soil scientists — in fact, all public spirited groups and individuals — agree on the need for policies and programs which will result in the least amount of hardship and suffering among disadvantaged farm families now settling on cut-over lands.

The complexities of these problems themselves point to the steps that need to be taken toward solution. It would be foolish to provide adequate drainage unless the new settlers can grow crops wherewith they can obtain credit, and can buy the land at reasonable prices and terms. It would be unwise to lend money for development of the cut-over

lands unless provision is made for adequate drainage and a cropping system that will enable the settlers to obtain a sizable cash income. If either of these major barriers to successful development is left in the way, the problem cannot be solved. An attempt at piecemeal solution would be worse than if no effort were made to help open the fertile Delta lands.

No one argues that the poor Delta lands be settled. A classification[7] of more than a million acres in the Yazoo-Mississippi backwater area reveals that nearly one-third (298,134 acres) of that particular area is not suited for agriculture. The same classification indicates, however, that 187,138 acres not now in cultivation could support a permanent agricultural population, insofar as the physical factors such as quality of soil, flooding and drainage are concerned and under present economic conditions. This breakdown leaves out of consideration marginal classes containing 175,323 acres of land now in woodland. Classification of the other 30 million acres in the Alluvial Valley would probably show similar results.

The classification of the Yazoo-Mississippi backwater area indicates that individual farm families cannot make a satisfactory farm income under any system of farming on one-third of the area (only a small acreage of this class of land is now in farms). This is obviously important to the rehabilitation loan program of the Farm Security Administration and to the program of the Farm Credit Administration since income expectancy must be the basis, in large part, of the loans. A policy relating loans to land classification is a strong inducement to families on poor lands to relocate elsewhere. The designation of certain areas as unsuited to agriculture implies that equally good or better opportunities are available elsewhere, either in agriculture or non-farm occupations, and that owners of poor land farms can be given an opportunity to sell their property to the government if a rehabilitation loan is not justified. Direct relief or grants for individual adjustments, rather than loans, may often be desirable.

The above proposal is not inconsistent with the policy which the Farm Security Administration inaugurated as early as 1939, when this agency began to require tenants applying for rehabilitation loans to obtain a written lease meeting certain minimum standards as a condition of receiving a loan.[8] "The . . . policy is designed", according to an FSA official, "not only as an attack on one problem of tenancy, but as a protection to the rehabilitation program", by providing in a written lease between the landlord and tenant:

> "that the tenant shall have either (1) definite security of tenure until he has received full benefit from use of the improvement, (2) equitable compensation for the unexhausted value of the improvement if his lease is terminated or expires before full benefit has been received, or (3) a definite agreement with the landlord by which he will be compensated or credited on rent for expenditures in making the improvement".[9]

The policy outlined here should be extended to include those new-ground farmers who have option-lease or purchase contracts, for in many respects they are quite similar to the tenant group. The provisions as listed would, in general, if incorporated in the option-lease or purchase contracts, be adequate for the protection of the purchaser's inter-

[7] *Mississippi Backwater Areas Study — Yazoo Segment.* U. S. Department of Agriculture (Processed) 1941.

[8] C. B. Baldwin, "Greater Security for Tenants". *The Agricultural Situation,* October, 1938, p. 12.

[9] *Ibid.* pp. 12-13.

ests and serve as security for the expenditures of the government. However, certain specific provisions would require careful scrutiny. One of these, which no blank form can overcome, is the price charged for cut-over land. The rate of interest and the period required for amortization fall into the same category. Consequently, government lending agencies can do much to encourage sound development of new lands by indicating to vendors of land that liberal credit assistance will be forthcoming only to settlers with proper contracts, including reasonable price, low interest rate and long terms for payment, as warranted by returns from the farm.

In the areas which have been classified as unsuited for agriculture, the payments for participation in the agricultural conservation program do not appear to result in an economic conservation of land resources. The question whether they are a socially desirable expenditure of public funds, except as a temporary expedient, is of course moot. That period of a temporary emergency needs to be brought to a conclusion in those areas not adapted to a permanent agriculture by adopting a policy which will provide alternatives and will discourage the use of lands not adapted for farm uses. More explicitly, in the Delta, where thousands of acres of fertile lands remain undeveloped, the agricultural conservation program and the rehabilitation program of the Farm Security Administration can encourage desirable shifts of families from poor lands to good lands. The 1941 AAA program adopted a modified form of this principle, although it was for a different purpose. The 1941 program denied payments with respect to the production of cotton on farms on which cotton had not been planted since January 1, 1938. This provision applies, however, to good land as well as poor. It might be considered as a means of discouraging settlement of lands unsuited to farming.

In addition to restriction of credit and benefit payments, settlement may be directed by rural zoning, public land purchase, road location and control of lands which are to be included in drainage enterprises.

If the states and their local units of government permit individuals to settle, almost without restriction, on poor soils, on land subject to periodic and disastrous overflows, or any combination of these hazardous conditions, numerous failures are inevitable. It is important, therefore, to have a means of avoiding such failure with a minimum of disruption and impediment to the general functioning of the economy. Rural zoning is one means by which many certain failures of small-scale farming can be avoided in the Delta. This form of land use control has been thoroughly treated by other writers and need only be mentioned here.

Additional complementary lines of action will hasten desirable changes in land use and occupancy. A complete, long-time readjustment of land use in the Delta will include public purchase of lands for forestry use, both in settled and unsettled areas. Public purchase is a positive and direct means of controlling settlement, but it can be a very costly method of effecting desirable land-use adjustments. The goal of both zoning and a land purchase program is to make sure that poor land is kept out of a wasteful use, that expenditures for essential public services are spent in the most economical manner possible, and that farm families are not doomed to a hopeless poverty.

Another effective measure for directing settlement in the undeveloped Delta areas generally rests in the hands of the

county-governing authorities who locate new county roads. Recommendations for the construction of new farm-to-market roads will undoubtedly be made from time to time, and since the county officials have the authority to locate such roads, their planning and construction in areas classified as suitable for agriculture can proceed as rapidly as the need justifies and finances permit. The refusal to build roads into non-agricultural areas and the widespread knowledge of the adoption of this policy by county officials will be a decided deterrent to settlement on lands not suited to farming. If road locations are determined in advance of settlement and if prospective settlers are fully informed concerning areas where roads will not be built as well as areas where roads will be constructed, settlement can be properly directed and costly mistakes of individuals and of government can be avoided.

Because of the increased protection offered by flood control works and the many other inducements resulting from public expenditures, all of which tend to encourage farmers to clear new lands, it would be desirable to deny approval of petitions to organize drainage districts in areas classified as unsuited to agriculture. If a centralized state agency were given authority to determine whether or not a drainage district should be established, then it would be possible to give more attention to the development of land for agricultural purposes and to restrict drainage districts to land suited to farming.

In order to develop cut-over areas in the Delta where it does not appear that the individual can do so with the means at his command, economists, sociologists and other social scientists, both in and out of the U. S. Department of Agriculture, may find it desirable to recommend subsidization of the development. We must inevitably make a choice and if that choice explicitly involves a policy of encouraging the establishment of family-sized farms on the cut-over lands in the Delta, then allocation of funds on a rational basis is involved and a portion of the expenditure considered as subsidy. It is conceivable, of course, even in the public economic interest, that the settlement might be consciously subsidized, if the addition to the total national income contributed by the new settlers were great enough. On the other hand, if the new settlers' incomes are so low that they do not provide for security and a satisfactory living (or at least a better living than they can obtain elsewhere) without permanent heavy contributions from public relief, a different public viewpoint must result. The land classification mentioned above implies that new settlers on areas classified as suited to agriculture will add enough to the total national income to justify the development of such areas, without requiring an unjustifiable subsidy. The same classification also implies, under present physical, economic and social conditions, that new settlers will not add enough to the total national income to justify the development of areas classified as unsuited to agriculture.

Summary

Thousands of families have settled recently on fertile cut-over lands of the Mississippi River Delta. All evidence points toward continued settlement and development of the lowlands of this valley. Millions of these acres are suited for agriculture and millions of these acres are unsuited for agriculture. Homeless families are buying land without regard to its suitability for farming. Hardships and disappointments are many, whether the new settler is on good land or on poor land. Land prices,

interest rates, purchase terms, drainage, roads, schools, credit, and cotton allotments are problems to the new settlers.

The cotton acreage adjustment program is vitally affected by the new-ground development because allotments to new-ground farms would increase the total cotton production if such allotments were in addition to those granted long-established producers. Actually, long-established cotton growers in the Delta counties have had their cotton acreage allotments decreased as new settlers move in to grow cotton. Farmers in the Delta counties have seen the proportion of their cropland permitted in cotton gradually decline while farmers in the upland counties were permitted to increase the percentage of cropland in cotton a little year by year. The adjustments are taking place between farmers within county boundaries rather than between upland and Delta areas.

New settlers in the Delta have been restricted with respect to acreage and benefit payments to such an extent that increasing numbers of them are intentionally overplanting in order to build up an adequate cotton acreage allotment. The restrictions may have had an opposite effect to that for which they were imposed; that is, cotton acreage in these particular areas of new settlement may have been increased rather than reduced as was anticipated.

Settlement can be guided with measures such as rural zoning, land purchase, restriction of credit and benefit payments and restriction of the location of roads and drainage districts. But with all the settlement guidance that can be provided, study is needed on further possible adjustments in the operation of the cotton program. Provision must be made so that new-ground farmers in the Delta, long-established farmers in the Delta, and farmers in the uplands use their land for whatever it is best adapted, physical and economic factors considered. At the same time each of these three groups must be enabled to earn a reasonably satisfactory income. Certain shifts in land use appear inevitable and the AAA program can be a means of encouraging desirable shifts of cotton production from poor to good land by areas as well as on the individual farm.

I. Incremental Cost Determination of Utility Prices

By EMERY TROXEL*

THERE has long been discontent with existing means of determining reasonable earnings and prices. Critics have either accepted one valuation basis of earnings determination and attacked other bases or they have deprecated the use of any valuation base of utility price control. By far the larger number of them have directed a steady flow of criticism against the fair-value doctrine and, more particularly, against the consideration of reproduction cost. This group has generally preferred simplification and revision of the method of property valuation, though it has not been uncommon for its members to propose a freezing of property valuations and variation of the rate of return as a substitute for consideration of reproduction cost. Sometimes they have advocated use of the devious and somewhat arbitrary method of the Massachusetts Commission, a form of prudent investment control in conjunction with long-standing regulation of the issuance and selling price of securities. In most instances, however, this group of critics has argued for original cost of property in the process of earnings control, knowing that many years of weak regulation of securities in most states is a limitation to adoption of the Massachusetts pattern.

The other group questions the broader concept of control by which earnings and prices are made a function of some property valuation. Persons in this class choose to reduce the determinative significance of property valuation in the process of control. At best they make valuation of property a convenient but not unavoidable step in earnings determination. Some persons, however, make even stronger proposals. They prefer abandonment altogether of property valuations. This is one of the features of the suggestion on price control which is to be discussed in this and two succeeding articles. It is proposed that public utility prices be determined by the incremental or marginal cost of the production of these services. In an environment of discontent with the prevailing forms of price control no one need be surprised, of course, by the presentation of another set of rules of public utility pricing. But when the tradition of earnings control with respect to some kind of property valuation is neglected, we encounter a far more revolutionary and interesting suggestion than if simply another kind of valuation were proposed. Thus, Professors Hotelling and Wallace, seeking independently a means of realizing more complete and efficient use of public utility plant, offer us the distinctly different and unquestionably interesting proposition of equating public utility prices with incremental costs.

Several General Considerations

Before this extraordinary proposal is examined, an elementary clarification of possible confusion of the meaning of average and incremental (marginal) cost may be in place.[1] In the case of

* Assistant Professor of Economics, Wayne University.

[1] For further rudimentary explanation of the use of terms employed herein, the reader is referred to A. L. Meyers, *Modern Economics.* (Prentice-Hall: 1941) esp., Ch. XII, "Temporary or Short-Run Equilibrium of the Firm or Industry"; or any of a number of other elementary economics texts.

an existing plant, the incremental cost of a unit of output is the difference between total cost when the unit is produced and total cost when it is not produced. As the term so clearly suggests, it is the increment in total cost respecting an increment in output. And an incremental cost series, which may be graphically drawn as a curve, represents the successive increments in total cost respecting successive increments in output. Such an incremental cost curve is presented in Figure I.

It is evident that incremental cost does not include what is commonly known as fixed cost. As a general rule incremental cost excludes all fixed costs but sometimes it may be defined to include increments in depreciation expense if the depreciation of plant is a function of plant use. In this case, depreciation expense is being treated as a variable cost. If the plant is not being used to enlarge output, the plant may remain serviceable for an extension of production at some future time. Using the plant today reduces its capacity for service tomorrow. Yet, measurement of the use portion of depreciation expense may not be very accurately done. Furthermore, at irregular times incremental cost may include the expenditures on plant enlargements. Once these investments are incurred they become past expenditures and are important only as a basis of determination of further fixed costs in interest and depreciation. But when they are occurring they are incremental costs quite as much as payrolls or expenditures on materials. As a general statement, incremental cost is an expenditure incurred in conjunction with output enlargement as distinguished from expenditures which *have been* incurred. Basically, it is a concept concerning increments in expenditures respecting increments in output.

Without the inclusion of these extraordinary expenditures—that is to say, the irregular investments resulting from plant enlargement—an incremental cost curve of course is below a downward sloping average cost curve and above an upward sloping average cost curve. (Cf., Figure 1 for an illustration.) It should be emphasized, however, that a rising incremental cost curve does not necessarily move indefinitely and smoothly in an upward direction. For one thing, there are technical limits of output enlargement with an existing plant. In these situations there is scarcely any significance in measurement of incremental costs except in terms of plant expansion and further investments.

As a final point on the general meaning and measurement of incremental costs, it should be emphasized that an incremental cost curve is rarely as smooth as indicated by the somewhat imaginary drawings of the economist. Any businessman knows about the irregularity of expenditures. Among the most irregular expenditures is a kind already mentioned, the expenditures on plant enlargement. Similarly, expenditures on repairs and maintenance are far from constant through time. Doubtless, expenditures for labor and materials have at least some minor irregularities. Consequently, an actual incremental cost curve, comparing one year with another, is more likely to be irregular than smooth.

Prevailing Use of Incremental Costs

The idea of pricing of utility service with respect to incremental costs is not utterly new. It is used by utility companies to determine the minimum prices of some kinds of service. When unused capacity exists, it is not uncommon for a company to give an "off-peak" or "sur-

plus" rate from which expected revenue at least covers or (preferably from the company view) exceeds the expected expenditures. The price in such a case is controlled by the anticipated relationship between the increments in revenue and increments in cost, both measured in terms of successive enlargements of output. This rule is often used for pricing interruptible service from "dump" supplies of natural gas, various kinds of limited service, or even some instances of expansion of rural electric service.

Commission decisions relating to the incremental cost basis of price determination are neither uniform nor frequent. Sometimes commissions have ordered extensions of service or have allowed rates for development of a new kind of service when the expected increment in revenue at least equalled the expected increment in expenditures. On the other hand, commissions are sometimes apprehensive that differential pricing based upon incremental costs may become a means of practising price discrimination. Several decisions of the New York Commission reveal this attitude. In a case involving a special rate for hot water heating, this Commission concluded that "by the incremental cost method, almost any . . . (rate) can be justified for any single customer . . ." and that it "produces amazing results if one can only shift to somebody else the large basic costs for providing and operating a system . . ."[2] In a later case the same Commission repeated this charge by saying that incremental cost pricing for street-lighting service "imposes a financial burden upon the stockholders or upon other customers."[3]

[2] *Re New York State E. & G. Corp.* (N. Y.), 6 P. U. R. (N. S.) 113 (1934).

[3] *Re Queens Borough G. & E. Co.* (N. Y.), 32 P. U. R. (N. S.) 71 (1939).

The Proposal

The suggestions for public utility pricing presented by Hotelling[4] and by Wallace[5] may be clearly distinguished from the partial, discretionary use of incremental cost pricing by public utilities. Both of these writers propose to make all public utility prices equal to incremental costs. They advocate complete use of the incremental cost rule. Moreover, it is conceived as a short-run rule of pricing, i.e., incremental cost is measured principally in terms of an existing plant. Both of the writers are aware, of course, of measurement of incremental costs in terms of a longer period of time; but apparently they are convinced that pricing, to have social significance, must be conceived in terms of immediate exchanges of goods. As noted later, this view is associated with their objective of enlargement of the use of resources.

Basically, the rule of incremental cost pricing rests on the concept of equating demand to the incremental costs of plant operation. If the rule is given a strictly short-run interpretation, decreases in demand usually are accompanied by decreases in price and increases in demand are followed by increases in price. Utility prices are reduced, perhaps drastically, during a depression and they are

[4] Harold Hotelling, "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates," *Econometrica*, July, 1938, pp. 242-69. Much of his reasoning is presented in mathematical form. This presentation of his views, however, is drawn principally from his non-mathematical formulation of the argument.

[5] Donald Wallace, "Kinds of Public Control to Replace or Supplement Antitrust Laws", *American Economic Review*, March, 1940 (supplement), pp. 194-212, esp. pp. 205-8; Temporary National Economic Committee, *Economic Standards of Government Price Control* (Monograph No. 32, Senate Committee Print, 76th Cong., 3d Sess., 1941), esp. pp. 414-5.

increased again and equally drastically during a period of prosperity. A distinctly short-run view of price control based on incremental cost has the effect of giving public utility prices much greater flexibility. Indeed, as we shall note shortly, such intensity of price fluctuation may necessitate a modification of the short- run concept of the rule.

For the sake of emphasis, it should be repeated that the proposed rule obviously bears no relation to the valuation of a public utility—the conventional means of earnings determination. There is no specific provision for depreciation. Nor is there any concern for measurement of the fair return. Though the payment to the company of a plant rental (as described later) with this form of pricing provides an opportunity to receive revenue in excess of current expenditures, there is no attempt to provide for a return on or the recovery of the investment in public utility plant. As Hotelling sees it, the investment in the Union Pacific, for instance, is merely an "interesting historical question" and it does not permit "charging enormous freight rates and claiming that their sum constitutes a measure of the value to the country of the investment".[6] Accordingly, "it will be better to operate the railroads for the benefit of living human beings, while letting dead men and dead investments rest quietly in their graves."[7]

Purpose in Incremental Cost Pricing

The basic purpose of incremental cost pricing is to secure an enlargement of output and increased consumption of public utility services toward the end of achieving efficient use of economic resources. It is put forward as a standard of pricing which will have a more evident regard for the well-being of society and the buyers of utility service than is the case with the traditional form of earnings and price control of utilities. For one thing, there is a concern for control of excess capacity of public utility plants, though, of course, an interest is expressed in providing inducements for investment of private funds in utility enterprises. At the same time, the efficiency of an existing plant is made a function of its use. The maximum possible enlargement of output, consistent with continuance of private operation, is sought from the resources at the disposal of utility firms. If a firm has over-extended its limits of operation, there is no concern for a return of the investment in the excessive plant. Rather, there is simply a concern for use of the plant. Meanwhile, the incremental cost rule facilitates elimination of excessive plant.

Incremental cost determines the minimum price consistent with enlargement of plant use and the continuance, in at least the short-run, of private operation of the plant. As Wallace says, "At any higher price, presumably somewhat less of the product will be taken by consumers; at any lower price the firm will reduce its output because price does not cover the amount of the additional expense which it must incur to produce the last additional run of production, with the results that continuance of production at that level would mean smaller profits than can be obtained by reducing output to the point where the price once more covers incremental costs."[8] Greater use of plant is made than if a total or average cost basis were used for price determination. But

[6] Hotelling, *op. cit.*, p. 268.
[7] *Ibid.*, p. 269.
[8] T. N. E. C., *op. cit.*, p. 414.

there is no assurance that some of the plant does not still remain unused. If the plant were notably excessive (perhaps because management greatly misjudged demand-expectations at the time of plant construction), fixing prices equal to incremental costs might enlarge but might not provide for full use of existing plant.

As a further point, the incremental cost rule is a means of simulating the pattern of pricing under conditions of pure competition. In an instance of pure competition the sum invested in a plant, say a wheat farm, has no bearing on short-run price determination. The seller, taking the market price as given and considering the demand for his output to be perfectly elastic, tries to control expenditures so that incremental cost equals the anticipated but given price. Forces of the market in which he operates compel him to ignore what he spent, wisely or foolishly, in the past. In this sense the incremental cost rule for public utility pricing may be likened to competitively determined prices. There is one essential difference. For utility companies the pricing pattern is being authoritatively prescribed, but for sellers under conditions of pure competition it is a recognized and unavoidable characteristic of the industry.

Small Output Increments

In considering the procedure of pricing with respect to incremental costs, there is the further question of the treatment of lumpy increments in cost. If a gas main is being laid, there are certain minimum sensible increments in expenditures in connection with its extension. The same observation may be made for extensions of service in other utility industries. Consequently, there is a lumpiness of incremental costs. Is such an increment in cost to be the price for the first unit of output or for the first new buyer connected with the service extension? Since such a price may be high enough to prohibit service or be inequitable to particular buyers, there is a need for spreading the increment in cost among the units of output connected with it. Hotelling encounters this condition in the instance where the cost of running another train is the incremental cost of carrying another passenger. If a sharp increase in passenger rates is to be avoided, he suggests that some sort of averaging of the costs be "based on the probability of having to run an extra train".[9]

Differential Pricing

Neither of the proponents of this form of pricing gives much attention to class pricing for utility services though Wallace does conclude that maximum efficiency in use of resources requires "that excess profits be eliminated by reductions in prices to those classes of consumers whose demands are more elastic".[10] This rule of pricing may be the basis for price differentiation. Limits of service expansion for each class of buyers may be determined by the incremental costs for each group. The price and output for a single class of buyers may be measured by the point of equivalence of their incremental cost and their demand. Thus, resources may be more efficiently used by allocating them according to differences in incremental costs for several classifications of buyers rather than according to the incremental costs for all buyers of the firm. And insofar as price reductions follow from the initial introduction of the rule of pricing, it

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[9] *Op. cit.*, p. 264.

[10] "Kinds of Public Control . . .", *op. cit.* p. 208.

is the buyers with the most elastic demand who effect the greatest increases in their purchases. But there are some real difficulties of differentiated pricing by means of the incremental cost rule, and in later installments more attention is given to the problem.

A Rental for Property Use

The revenue effects of incremental cost pricing may not be as disturbing to the private firm as some persons, confronting this form of pricing for the first time, may suspect. Though his meaning is far from clear, Hotelling provides for payment of a "rental" as a means of limiting the use of existing equipment. This rental, existing only when there is a scarcity of plant capacity or when "it is not feasible or it is of doubtful wisdom to increase the amount of equipment", fixes a "sufficiently high price to limit the demand".[11] The rental is part of the rate but is never "so high as to limit travel to fewer persons than can be comfortably accommodated." [12]

At no point in the discussion of the rental, however, does Hotelling indicate whether prices remain equated to incremental cost even with the receipt of the rental or whether the rental charge represents an addition to prices determined already by means of incremental cost. In some instances he is speaking of the rental as a price for the use of scarce and fully used equipment without regard for increments in cost. His examples illustrating this view concern principally holiday season rates for railway travel, a case of pricing where the increase in demand is of such short duration that additional expenditures for equipment may not be undertaken. This may be considered a condition of equating demand to the immediately available plant capacity, the basic objective rather than the working form of incremental cost pricing. Approximately the same effect might be achieved in such a short period by equating the price to the increment in costs which would be incurred if time permitted. Elsewhere, several remarks make it clear that the rental is derived from the revenue effects of making prices equal to incremental costs. He likens the rental to a land rental, being aware, surely, that land rentals are commonly measured with reference to equivalence of price and incremental cost. And in another instance he says that rental charges for equipment "would largely take the place of fares" for passenger travel.

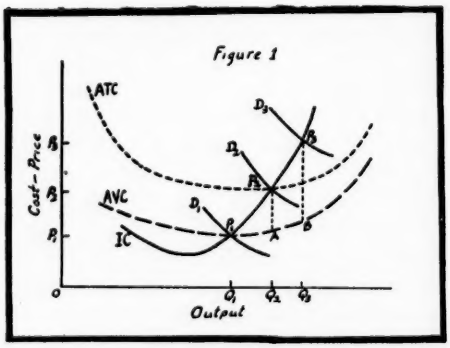
The receipt of a property rental by a utility firm is unquestionably compatible with the rule of equating prices and incremental costs. But this is scarcely evident unless there is further discussion of the meaning and measurement of the rental. Let us begin by assuming that the price for the output of a utility firm is equated to incremental cost. Then let us define the rental for a period of operations of the firm as the difference between total revenue and total expenditures of the period. Such a rental for an existing plant is affected significantly by changes in demand. As a general rule, increases in demand, accompanied by increases in price (incremental cost) and total revenue, result in the receipt of higher rentals. Both the amount of unused plant capacity and the state of demand for plant output are important determinants of the size of the plant rental. Moreover, as is quite apparent, when there is no rental and when none is anticipated, i.e., when total expenditures are, and promise to continue to be less than total revenue, the firm chooses to cease operations rather than

[11] Hotelling, *op. cit.*, p. 257.
[12] *Ibid.*, p. 264.

accept the proffered equation of prices and incremental costs.

All of this reasoning may be readily expressed in a diagram. In Figure 1, ATC, AVC and IC are the average total cost, average variable cost and incremental cost curves, respectively. (Any conceivable bumpiness and irregularities of these cost curves are eliminated for the sake of convenience of expression and generalization of the reasoning.) Furthermore, D_1, D_2 and D_3 represent three conditions of demand.

Given a demand of D_1 for the product of the utility firm, the price, P_1, is determined, as in the case of the other prices, by the intersection of the demand curve and incremental cost curve. Since P_1 is equal to the AVC for the output Q_1, there is no plant rental. It may be further observed that, if a price lower than P_1 is fixed by the rule, the firm will



prefer to abandon operations rather than receive less total revenue than the total variable costs. As the demand increases above D_1, the firm begins to receive a plant rental. With a demand of D_3 and a consequent price of P_3 the rental, measured according to the definition used here, is P_3B (the per-unit rental) times the output Q_3. This rental is found in conjunction with an increasing cost condition. And it is evident that intensive use of an existing utility plant may result in the receipt of very substantial plant rentals.

Repeating an earlier observation, price determination with respect to incremental cost takes no account of the depreciation and return provisions. But the rental may be large enough to cover what would have been the sums selected for these provisions. At P_2 these provisions and total variable cost are exactly covered by the total revenue of the firm. This is true by definition for the ATC for output Q_2, exactly equal to P_2, presumably accounts for the return and depreciation provisions. At P_3 incremental cost pricing has proven very beneficial for the firm, for the rental is considerably more than sufficient to account for the return on and return of the firm's investment in plant. Still one must agree with Hotelling that "there should be no attempt to pay all the overhead from rental charges alone" when the incremental cost rule is used. This form of pricing disregards past expenditures on utility plant and the rental, which may or may not provide current justification for these investments, is primarily a function of unused plant capacity and of the state of demand for plant output.

Maintaining Earnings Expectations

Wallace does not use or mention any rental sum in connection with his proposals for equating prices to incremental costs. Though he is primarily concerned with a short-run criterion of pricing, he is not aware of a possible need for a higher price than some short-run uses of the incremental cost rule may permit. For a maturing firm as distinguished from a contracting one, he recognizes that the objective of maximum output cannot be dissociated from long-run output and achievement of maximum

investment. Consequently he proposes an increase in prices above those determined by the incremental cost rule for the purpose of attracting new capital as demand increases. Unfortunately, no effort is made to describe the measurement of this differential. Perhaps there is some unmentioned inference about long-run incremental cost, the increments in total cost, particularly increments in investment expenditures, needed through time to maintain successively larger amounts of plant and output. There are, of course, some apparent limitations of the size of the differential. Presumably, in terms of Figure 1, he is not thinking of a price higher than P_2. Otherwise, the per-unit rental (or differential) may be more than sufficient to maintain the "chosen" flow of investment. Between prices P_1 and P_2 there is a possible range of prices, equated to incremental cost, which are not high enough to justify either the past investment or (probably) the future investment in this scale and kind of plant. These prices may be supplemented by a differential, though this added price may represent payment for overinvestment. Still there is danger that this differential may be simply an arbitrary addition to the price determined by incremental cost.

More explicit meaning is given to the differential in the instance of unavoidable overinvestment. Wallace considers the overinvestment unavoidable "whenever technological conditions and demand characteristics are such that maximum efficiency requires an amount of investment that will not ordinarily be used, even with prices equal to incremental cost".[13] Some measure of unused plant capacity, even at the time of the peak load, is an example of unavoidable overinvestment. Another occurs when incremental cost, being nearly constant for a considerable range of output, suddenly shoots — "balloons" — upward as the limit of plant capacity is approached. When such cost conditions are associated with frequent fluctuations in demand, either prices are fixed above incremental costs or buyers must accept very sharp cyclical changes in prices. And, as Wallace observes, the differential determined with respect to such conditions may be continuously adjusted to account for changes in technology or peculiarities of investors. Recognition of these particular reasons for prices in excess of incremental costs does not remove, however, the difficulty of determining the differential. It may be agreed that utility firms, if continuity of service is to be maintained, must be permitted a rental or price for unused but necessary plant capacity. But this admission does not improve a person's ability to measure this price. In the end the price, to be compatible with the maintenance of profit expectations, may destroy the basic importance of the incremental cost and price equation, giving merely a new name to the conventional procedure of earnings and price determination. (P_2 in Figure 1 is a possible example.)

On the other hand, there is no similar concern for maintenance of profit expectations of contracting firms and cases of avoidable overinvestment. Hotelling, who is dealing predominantly with railroads, is almost exclusively concerned with cases of excessive plant capacity. Wallace, giving limited attention to this condition, proposes as does Hotelling that prices be equated to incremental costs at all but a few times. In this manner a price is not being paid for use of unnecessary plant and, as well, excessive plant is more quickly eliminated than if a price is paid for its existence.

[13] "Kinds of Public Control . . .", *op. cit.*, p. 207.

But Wallace does admit that a price above incremental cost may be necessary "to obtain capital for modernization of equipment in order to reduce cost".[14] Apparently this is the problem of maintaining earnings expectations so that even a contracting firm invests in an optimum but smaller sized plant. Consequently, there needs to be consideration of profit expectations with respect to an alternative, even nonexistent scale of plant. This problem presumes, as we shall more carefully note in the next installment of this series of articles, a concept by the commission of an optimum or "chosen" scale of plant operations.

Summation

Let us reconstruct the outline of the incremental cost pattern of pricing, omitting consideration of the extra factor of profit maintenance. The essential rule is equation of the capacity of an *existing plant* to the demand for it. For the purpose of controlling the relation of plant capacity and demand, the basic form of pricing for this purpose is equivalence of prices and incremental costs. If the demand for plant output is low enough or if the available plant capacity is large enough, the price, being equivalent to incremental cost, may be below the customary measures of average cost. When a plant has much excessive capacity, coverage of the depreciation and return provisions is not assured. But, as demand increases and as further use of plant occurs under a condition of increasing incremental cost, the total revenue of the firm rises. Thus, the plant rental, as described in connection with Figure 1, is enlarged. Demand may increase until, with a sharply rising incremental cost curve, the price is above average cost. In this case the rental is large enough to cover the conventionally determined provisions for depreciation and return and still leave a profit for the firm.

Some Obvious Admissions

Whatever may be said in criticism of this pricing proposal, there are some general matters which may well be admitted. The existing form of earnings and rate control of public utilities is not designed to achieve maximum efficiency and full use of the resources available to utility firms. Utility commissions and jurists rarely concern themselves with intensive examination of such problems as optimum allocation of resources or maximization of social benefits from the use of resources. Rather, there seems to be little association of regulatory concepts with general economic or social life, and consequently utility regulation appears to be conceived to operate autonomously. And, as Gray has recently emphasized, the public utility concept may be perverted so that it constitutes protection for vested interests.[15] At least the effects, if not the nature, of the concepts of fair value and a fair return often seem to reflect more attention to protection of investment values or regulated companies than to social well-being. A pricing rule, giving railroad firms a reason for requesting higher freight rates during the nation's greatest depression, is suspect.

Economists have long recognized that the objective of fullness of resource use is a worthy if not necessary end of economic organization. Indeed, much of

[14] T. N. E. C., *op. cit.*, p. 415.

[15] Horace M. Gray, "The Passing of the Public Utility Concept", *The Journal of Land & Public Utility Economics*, February, 1940, pp. 8-20.

their discussion of economic life assumes the existence of fullness of resource use or reviles the absence of it. Yet they are aware of the lack of social compulsion on any single business enterprise to seek such social objectives. Nor do they commonly see much evidence of awakened altruism among the financial and business leaders of the country. Thus, one may broaden the indictment about inefficiency of resource use by suggesting a need for equating prices and incremental costs in the functioning of the entire economic system.

But, as long as private investment and ownership exist, it may be too much to expect continuance of replacement and investment in the present scale of public utility plants if a change were made to an incremental cost basis of price determination. To operate successfully with this pricing rule may require, in addition to the revisions of regulatory policy, greater institutional changes than the proponents of the proposal have recorded. In a subsequent issue of this *Journal* there will be an examination of some of the effects and difficulties, suggested but not explored in this article, of using the incremental cost pattern of pricing the output of utility firms.

Land-Use Control in the Urban Fringe of Portland, Oregon

By FREDERICK ARPKE *

FOR the purpose of this article the urban fringe may be defined as that cultural development that takes place outside the political boundaries of central cities and extends to the areas of predominantly agricultural activity. Use of the political boundary of the central city as the inner limit is deliberate and is based on the belief that the principal difficulties in the fringe arise from the attempt to carry on a distinctly urban development without the benefit of recognized political controls and facilities.

Studies of the urban fringe have tended to emphasize the nature of the physical pattern resulting from the extension of urban agglomerations into the periphery. Much more attention needs to be directed to the awkward situation that invariably develops in the local government of metropolitan regions not only because such situations operate as independent, causal factors in the whole nexus of metropolitan problems but also because more adequate public controls are a prerequisite to a readjustment program of any kind regardless of the nature of the problem.

Normal expansion of an urban culture gradually and inevitably leaps the arbitrary boundaries of organized city government. From a physical standpoint this extra-mural development may display no distinguishing characteristics — but this should not obscure the really important fact that such developments escape the controls that are ordinarily associated with organized urban life. Furthermore, they require the organization of many uni-purpose and independent public service districts, the principal misfortune of which is not so much the inefficiency and poor quality of public services that invariably accompany such a situation, but rather the fact that an orderly and unified approach to the many inter-related problems of metropolitan areas becomes impossible.

Whether the urban fringe occupies a parasitic relationship to the city, as some would argue, need not be discussed here. Obviously the relationship is close. But it is a case of interdependence rather than complete dependence of either one upon the other. Obviously the periphery owes its existence to the city; but our cities are discovering that more and more of their vital activities must be undertaken outside the incorporated areas. As an example, one might cite the location of the new industrial plants far from the city center but within the metropolitan area and motivated by the requirements of ample floor space in one-story buildings, abundant light, recreation areas, parking space and easy accessibility by workers. For obvious reasons such facilities as airports, waste disposal plants and extensive recreational areas must look more and more to the fringe area for their proper location.

Nor can certain urban problems be resolved within the confines of city boundaries. Can the much discussed problem of urban blight be considered

* Bonneville Power Administration, U. S. Department of the Interior.

a "city" problem in view of the migration of city residents to the fringe and the widespread decentralization of retail establishments? Can the effects of rising property taxes on urban home ownership be regarded as purely a city problem in view of the tendency to escape such high tax rates by migration to the fringe, encouraged in many cases by both private and public agencies? Are the rising city expenditures for such things as new arterial highways which are planned in many cases to facilitate commuting between the workshop in the city and the bedroom in the country, as well as other costs of urban redevelopment, to be regarded as the exclusive responsibility of the central city? Can the catch-as-catch-can competition for land use in the urban fringe be ignored by the central city in view of the growing dependence upon the periphery for vital functions? It is difficult to escape the conclusion that from an economic and sociological standpoint the city and the urban fringe are a functional unit in spite of the unfortunate and wasteful political separation.

Reasons for establishing a city boundary in the first place are understandable. Basically they derive from the fact that many services supplied by a city have definite spatial significance. For example, the cost of building streets and sewers is directly related to the area covered. Some limitations as to the area within which these improvements will be made are necessary, of course. It has been expedient to draw an arbitrary outer limit within which these services would gradually be extended. Once established, these lines have taken on added significance due to the fact that they create important differentials in tax rates. Subsequent readjustments to conform with actual urban growth become virtually a political impossibility.

The disinclination on the part of any group deliberately to vote itself into a much higher tax area can be appreciated. But other forces are in operation also. Many land owners fear the effect of city zoning restrictions. City real estate boards are frightened with the prospect that an extension of city boundaries may further increase the attractiveness of living in less congested areas and thereby diminish the demand for city property. These are but a few of the basic difficulties in the way of a unified approach to the many problems of metropolitan areas. In the absence of a satisfactory administrative organization with authority not only to plan but also to implement and finance the plans for the entire area of metropolitan influence, the only recourse in the past has been to disregard the true nature of the problem and to proceed as far as possible by means of cumbersome makeshift arrangements with other administrative agencies such as county offices, special districts, satellite municipalities, etc.

That a haphazard approach has been tolerated in the past is not necessarily an indication that it must be continued in the future. The basis for this doubt is the strong probability that metropolitan areas will continue to attract a growing proportion of our population and will assume an even more important role in our economic and cultural life and also that the redevelopment of these areas should constitute the most important outlet for post-war capital investment. Industrial expansion in the post-war period, however it may be motivated, should eclipse anything in our past experience if we are to justify the tremendous price now being paid for the privilege of planning the future. This industrial expansion will have a particular significance for the urban fringe of metropolitan areas in spite of

the much discussed tendency of industry to decentralize. The advantages of industrial location in the midst of large population centers in order to gain the benefits of better terminal facilities, proximity to related industries and other needed services, availability of skilled labor supply, etcetera, are just as important today as they have ever been and will continue to be so, particularly if the net diseconomies that arise from urban congestion can be avoided. There is reason to believe, therefore, that industrial growth on the periphery of established centers will completely overshadow relocation in remote and smaller communities.

Further, there is certainly no reason to anticipate any serious interruption in the current flow of population to the urban fringe. That such a flow is taking place appears to be well demonstrated by an examination of the 1940 census data on metropolitan areas. Between 1930 and 1940 the population growth in the areas outside the central cities but within metropolitan districts was greater than that of the central cities themselves. Of particular interest is the fact that 60 per cent of this increase outside the central cities took place in the unincorporated areas.

If these unincorporated areas in metropolitan districts are regarded as urban, which appears more realistic than the census classification of all unincorporated areas as rural, along with towns of less than 2,500, then the traditional trend of the growing importance of urban life appears to be continuing uninterruptedly and in complete disregard of political boundaries. (Table I).

TABLE I. REDISTRIBUTION OF POPULATION BETWEEN URBAN AND RURAL 1930 AND 1940.

Population distribution	1940		1930		Increase 1930-1940	
	Number	Per cent	Number	Per cent	Number	Per cent
Total population	131,669,275	100.0	122,775,046	100.0	8,894,229	7.2
Census, urban (over 2,500)	74,423,702	56.5	68,954,823	56.2	5,468,879	7.9
Census, rural (unincorporated and under 2,500)	57,245,573	43.5	53,820,223	43.8	3,425,350	6.4
Unincorporated area	47,902,896	36.4	44,636,770	36.4	3,266,126	7.3
a. Inside metrop. district	8,334,529	6.4	6,585,460	5.4	1,749,069	26.6
b. Outside metrop. district	39,568,367	30.0	38,051,310	31.0	1,517,057	4.0
Incorporated area	83,766,379	63.6	78,138,276	63.6	5,628,103	7.2
c. Towns under 2,500	9,342,677	7.1	9,183,453	7.5	159,224	1.7
d. Towns over 2,500	74,423,702	56.5	68,954,823	56.1	5,468,879	7.9
Rural (b & c)	48,911,044	37.1	47,234,763	38.5	1,676,281	3.5
Urban (a & d)	82,758,231	62.9	75,540,283	61.5	7,217,948	9.5

Under present circumstances, as they exist in most metropolitan areas, a continuation of current trends will surely result in further complications in the organization of special districts and local governmental organizations, in further platting of subdivisions for residential use far beyond reasonable needs, and in a gradual loss of the city's most valuable asset – ample space in the periphery in which to locate and develop in an orderly fashion the facilities which can mean so much to the general welfare of all metropolitans.

The Portland Region

A brief description of the development of the metropolitan area of Portland, Oregon will serve to throw some light on the situations that emerge in the urban fringe of practically every city.

Although located more than 100 miles from the ocean, Portland has good shipping facilities and its growth has always been linked with the fortunes of the lumber industry. It also serves as the commercial and financial center for a large agricultural hinterland corresponding roughly to the lower Columbia River watershed which includes all of the Willamette Valley extending 150 miles to the south. Industrial activity has been largely limited to those functions associated with the fabrication of lumber products and food processing, although public development of the immense hydro-electric power potentialities of the Columbia River in recent years is beginning to broaden the industrial base. Rapid expansion in the lumber industry at the turn of the century provides the chief explanation for the city's population increase of 130 per cent from 1900 to 1910. With the exception of this decade, population growth has been steady but unsensational.

In 1940, 305,394 people lived within the city limits, an increase of only 3,579, or 1.2 per cent, over 1930. The population of the 8 small incorporated areas within the metropolitan district increased 16.2 per cent, – from 30,381 to 35,306. But the largest increase took place in the unincorporated area where the population rose from 46,532 in 1930 to 65,706, an increase of 41.2 per cent.

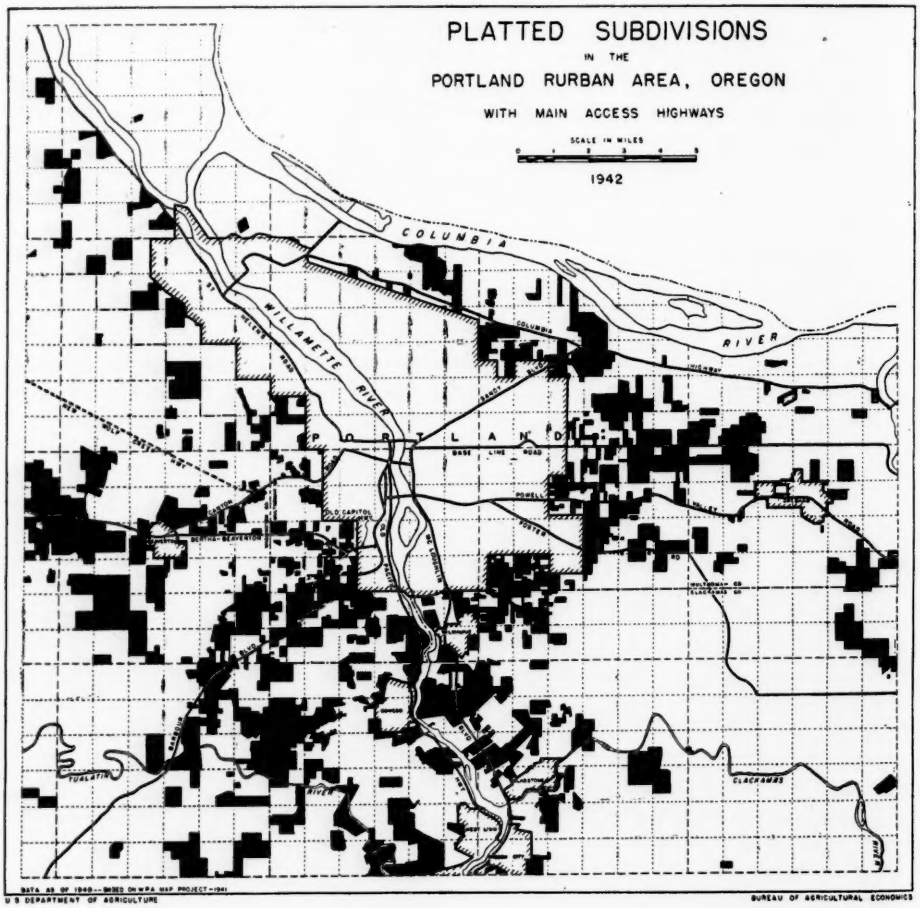
War industries have attracted more than 70,000 people to this metropolitan region since 1940 – nearly three times the increase for the preceding decade. While the distribution by districts is not available, the same forces in operation during the past decade can certainly be expected eventually to disperse the bulk of this increase into the urban fringe, even though at the moment every previously abandoned but habitable structure in the city is being occupied.

The reasons why people are moving to the urban fringe are now quite generally understood.[1] Briefly, it can be said that a widely shared desire to escape the congestion, dirt, noise and high cost of living in the city has in recent years been facilitated by the automobile and good roads with observable results. No doubt many of the undesirable features of city life responsible for this movement could have been eliminated, or might still be eliminated by a suitable program of urban re-development. However, most cities have not chosen to redesign and rebuild with the result that residents have seized the opportunity to escape to more desirable surroundings.

It is true that the assumed cost of living differential frequently has proved a myth. In the case of the Portland region, for example, many have been influenced

[1] Cf., Richard B. Andrews, "Elements in the Urban-Fringe Pattern", *The Journal of Land and Public Utility Economics*, May, 1942.

to move to the fringe because of substantial differences in tax rates. In many sections of the fringe, these rates range from 50 to 60 per cent of the city rate. However, most of this advantage is canceled by the higher costs of other services. Water rates are roughly 50 per cent higher outside the city limits and are set by the city water department from whom nearly all outlying districts purchase water. Fire insurance for a $5,000 frame house that costs $10.00 inside the city costs $30.00 outside the city. Telephone rates increase in relation to distance from the city exchange boundary line from 25c per quarter mile for a four-party line to 50c for a one-party line. Thus a one-party line 3 miles from the city exchange line would cost $72.00 more annually than comparable service inside the city. When additional transportation costs are added it appears quite unlikely that the monetary considerations could weigh very heavily in the decision to "get out of town". Other more tangible motives are undoubtedly



of greater importance – the desire for more space within which to pursue hobbies, the feeling that the country is a better place for children, pride in the ownership and personal development of an attractive home, etc.

General Features of Land Use Pattern

Portland itself straddles the Willamette River. The main business section is on the west side lying between the river and a high ridge that, until recently, has restricted any rapid residential expansion to the west. The main residential district on the east side covers the wide flat plain lying between the Willamette River and the Columbia River to the north.

Residential dispersion in the past has quite naturally followed the lines of least resistance toward the east where road and sewer construction was a relatively simple matter. Hilly terrain on the west side presented a different situation and limited construction to more expensive homes. Interurban rail service and, more recently, expensive road construction opened the region beyond the western ridge. Until the war, this was the scene of the most development.

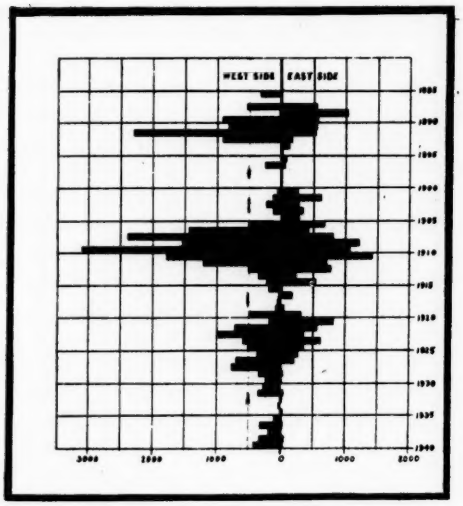
The present land-use pattern obviously owes much to the original location of the several interurban rail lines which at one time provided good transit facilities to Oregon City, Gresham, Beaverton and the small intermediate communities stimulated by such rail service. All but one of these lines have long since been discontinued – victims of the automobile and good roads.

The first major road construction in Multnomah County since the advent of the automobile, was made possible by the authorization of a $1,250,000 bond issue in 1915, after a long and bitter fight between sincere advocates of good roads, taxpayers' organizations, manufacturers of concrete and manufacturers of asphalt. Naturally the selection of roads to be improved under this program was influenced by the existing pattern of rural communities and dirt roads with the result that most of the new construction was undertaken on the east side – four roads extending almost straight east for from 5 to 10 miles. On the west side the old Capitol highway, extending from the southwest corner of the city, was built to serve the communities originally dependent on the electric railway and to serve as the main west side entrance to the city from the south. This road and the Canyon road, extending directly west from the heart of the city over the high ridge toward Beaverton, are of particular interest because of their part in facilitating the exploitation by urbanites of an extensive and very desirable residential area beyond the western ridge.

Most residential development in the urban fringe takes place within platted subdivisions or on acreage properties in close proximity to such platted lands. A subdivision map is thus a reasonably accurate picture of the direction and intensity of such development. Such a map for the Portland region, plus data presented in the figure and in Table II, illustrate several interesting characteristics. One is the definite shift in emphasis from the east side to the west side. The development of new subdivisions on the east side has fallen off steadily in recent years. Since 1918, 3,962 acres have been subdivided on the east side compared with 7,770 acres on the west side. This acreage differential is partly explained by a difference in lot size that has always existed between the two areas, lots on the west side averaging about twice the size of those on the east side.

Since 1924 the shift in emphasis to the west side has been even more pro-

NUMBER OF ACRES PLATTED IN THE PORTLAND RURBAN AREA, BY YEARS



nounced. During this period, 4,732 acres have been platted on the west side and 1,225 on the east side. A complete explanation of this shift would go far toward an explanation of the major trends in the urban fringe, since the west side development offers an interesting example of the newer, more decentralized land-use pattern that appears wherever road construction opens up virgin land for the promoters.

The cyclical nature of subdivision development is well demonstrated in the accompanying figure. The three 16-year cycles undoubtedly have a direct relation to the business cycle and especially to business conditions in Portland. However, the amplitude of the fluctuations and the points of inflection differ significantly. It is particularly interesting to note that the number of acres platted annually in the case of each cycle began to fall off several years *before* the break in business conditions. This was particularly true for the period from 1918 to 1933. Acres platted began to fall off in 1924, 5 years before the break in general business conditions and the peak period of lumber production in Oregon and lumber shipments from Portland.

But by far the most interesting feature, illustrated by these data, is the fact that land has been subdivided far beyond the needs of the community. By

TABLE II. GROWTH IN THE NUMBER OF SUBDIVISIONS, LOTS AND ACRES PLATTED IN PORTLAND URBAN AREA, 1880-1940.

Cyclical period	East Side				West Side			
	Subdivisions	Lots	Acreage		Subdivisions	Lots	Acreage	
			Total	Per Lot			Total	Lot Per
	No.	*No.*	*Acres*	*Acres*	*No.*	*No.*	*Acres*	*Acres*
1881-1897	134	8,394	4,104	.5	69	12,392	7,155	.6
1900-1917	199	17,225	9,903	.6	182	14,312	13,732	.9
1918-1933	139	7,844	3,726	.5	111	5,431	6,502	1.2
1934-1940	19	581	236	.4	44	1,356	1,268	.9
Total	491	34,044	17,969	.5	406	33,491	28,657	.9

1940, 896 subdivisions had been platted within a distance of 8 miles from the city limits (roughly the area included in this study) representing a total of 46,626 acres. As early as 1925 the area thus platted in the urban fringe was equal to the area of the entire central city.

If fully developed, these subdivisions could easily house the entire city of Portland in single dwelling homes placed on lots six times as large as the typical city lots of 50 by 100 feet. On the basis of these smaller lots, the subdivided land in the urban fringe alone is capable of furnishing single dwelling housing space for a population of 1,500,000 persons.

To what degree is this immense supply of platted lots being utilized? As indicated in Table II, in 1940 the platted area on the entire west side was laid out in 33,491 lots that accounted for 28,657 acres of land. Only 8,413 of these lots had building of any kind on them, indicating that not more than 25 per cent of the lots were actually in use for the purpose for which they were laid out. In other words, approximately 21,000 acres of land in platted subdivisions on the west side alone were lying idle. On the more established east side the degree of utilization is somewhat higher. There, 45 per cent of the platted lots had improvements on them in 1940.

Governmental Framework

Location of the city in the southwest corner of Multnomah County has meant that much of the urban fringe is found in Washington County to the west and Clackamas County to the south. A small part of Clark County in the state of Washington, directly across the Columbia River and including the city of Vancouver, is also in the metropolitan district of Portland, but was not included in this study. Attention was centered on the area in Oregon within which urbanites regularly commute which corresponds roughly to a rectangle extending some 25 miles from east to west and from 13 to 18 miles from north to south, depending on the location of the Columbia River which cuts across the northeast.

Governmental organization for this total area of some 470 square miles and over 400,000 people includes one central city, three counties, 54 school districts, 32 special water districts, 4 special fire protection districts and 7 special drainage districts. All of these agencies possess and exercise the power to tax and to carry out independently the functions for which they were organized.

The regrettable feature of this situation is the absence of a planning and administrative agency that can plan for the development of the metropolitan area as a whole and administer the various functions in the interest of the highest welfare of the community, a goal scarcely to be attained by a fragmentary approach. The question of the relative efficiency of water distribution by a single metropolitan water department or by 30-40 water districts, while important, is not nearly so significant as the fact that (a) no blueprint or plan for the development of greater Portland exists which would indicate where a water system should be extended and where it should not be extended because of the handicaps it might place on a more appropriate use of land, and (b), in the absence of such a plan, special districts are free to spring up wherever and whenever a small group is capable of voting in a large enough block of assessed values to form a tax base for such a district.

Once such a district is formed, it serves to encourage further urbanization by virtue of the fact that it provides an

important urban comfort. Thus in an unofficial and completely indiscriminate way the area is classified as residential. Not only is residential use encouraged in this way but other less intensive land uses are discouraged by the combined effects of higher tax rates and increases in the assessed valuations, which increase overhead costs to the point where transfer to a more intensive land use becomes virtually mandatory.

In 1940 there were in the Portland fringe area over 50 water districts that covered nearly 56,000 acres, an area about 30 per cent larger than that of the city itself. Thirty-two of these districts, accounting for 87 per cent of this area, were tax-levying districts and in 1940 their rates ranged as high as 11.5 mills. The median rate was 5.6 mills.

In forming a water district an attempt is always made to include as much assessed valuation as possible. This means the inclusion of a large amount of land in agricultural use and best adapted to a continuation of such use, in spite of the fact that the water is far too expensive to be used for agricultural purposes. Thus a farmstead with its high ratio of land value to total value is forced to pay a disproportionate share of what is, after all, a distinctly urban improvement.

One of the most recently formed districts, for example, covers an area of over 6 square miles – much of which is in agricultural use. In 1940 there were only 38 customers chiefly concentrated in one or two subdivisions. If the annual tax bill were distributed among these users, it would amount to $35 apiece. But by distributing it over the more than 3,700 acres, the necessary funds were raised by a levy which in 1940 amounted to 5.6 mills.

The part played by county government and particularly the situation created by the influence of three county governments, which is the situation in the Portland metropolitan area, should be considered at this point. Although the influence of the county, in the process of urbanization in the fringe, is almost entirely a negative one, it is nevertheless an important and too frequently overlooked factor. In Oregon, as in most states, the administration of the property tax is a county function. The many shortcomings of the property tax will not be discussed here; but one feature is of critical importance to the fortunes of the urban fringe – the assessment procedure.

Determination of real property values is always a somewhat uncertain procedure; but in areas of predominantly one type of land use the discrepancies are not usually great and certainly not serious since adequate standards exist for making corrections. Thus, in a strictly urban area or in a farming district, original assessment or subsequent adjustment of assessed values in conformity with true values is a relatively simple procedure. But the urban fringe is characterized by a great variety of land uses of almost every degree of intensity. The value of land for residential purposes is, of course, much higher than its agricultural value. Sales of land at the higher residential figure take place throughout the entire fringe area all of which has become a potential residential district. The natural result of a situation such as this is a strong tendency on the part of assessors to appraise property on the basis of its *potential* value, which is arrived at by reason of proximity to other parcels that have recently been sold and for which the consideration is known. The reasoning here is that if one particular piece of property can sell for 700 dollars an acre, then other properties in the immediate vicinity, and with presumably all of the same

advantages, should be worth as much. Since residential use, as described above, is pretty well dispersed throughout the area, this upping of assessed values is also widespread. At a result the relation between assessed value and the actual use value breaks down completely for large areas of the urban fringe.

A common procedure for checking the accuracy of the assessment procedure is to make a periodic comparison between assessed values and the consideration involved in actual transactions. A relatively close correlation leads to the conclusion that the assessment procedure is reasonable and fair. While this procedure has considerable merit in more or less single use areas, such as a strictly urban area or a strictly rural area, it is quite inappropriate in areas such as those under consideration in view of the fact that practically no one makes a cash purchase of land on the urban periphery with the serious intention of using this land for commercial agriculture. One would naturally expect a close correlation between the high assessed values on the periphery and the prices paid for residential properties. But this high correlation does not necessarily indicate an equitable assessment in the case of the vast majority of parcels that are not fortunate enough to be selected and sold for residential use but are, nevertheless, assessed on the basis of such a possibility, however remote it may be.

The significance of this feature of the assessment procedure cannot be too greatly emphasized. In the absence of more specific and proper planning devices it plays an important part in the determination of land uses by encouraging residential use and by making any other less intensive use virtually impossible as a long-run undertaking.

Immediate environs of most cities offer excellent opportunities from the standpoint of soils, marketing facilities, price, etcetera, for certain intensive agricultural activities. Some areas are not well adapted to any other use. Thus a restriction to agricultural activity alone might, from the standpoint of the community, constitute the highest use, even though, from the standpoint of the individual, a residential development in the midst of a farming area would ordinarily constitute a higher use. But the combined effect of high assessed values based largely on the potential residential value instead of on current income, plus rising tax rates introduced to finance urban conveniences, tends to force land into residential use which is alone capable of carrying the higher charges. High per acre taxes as indicated by the experience of 40 sample farms located in the urban fringe and illustrated in Table III, suggest why agriculture as a long-run commercial undertaking is not practical.

TABLE III. AVERAGE LAND TAXES PER ACRE ON 40 SAMPLE FARMS IN URBAN FRINGE.

County	Taxes per Acre			
	1940	1930	1920	1910
	Dollars	*Dollars*	*Dollars*	*Dollars*
Multnomah	13.48	12.90	7.71	2.48
Clackamas	9.25	12.57	10.76	3.70
Washington	4.18	5.74	5.12	1.30

In the case of all of these farms some kind of agricultural activity was being carried on but in many instances the rent failed to equal the tax bill. Personal interviews indicated that in every instance the owner was frankly bewildered as to what he ought to do under the circumstances. Most of them realized that the only way out was to subdivide but few had the necessary experience and courage and they were skeptical of promoters. Four of the sample farms were dairies. Their situation must be

regarded as less acute since their activities are more comparable to an industrial establishment with the land used only as a feeding lot and distribution headquarters. One owner with excellent river bottom land, but land which was not particularly desirable for residential use, felt that his only hope was a sale to some industrial establishment – certainly a distant hope. All were very much aware of the pressure that was gradually forcing them to do something with the land other than farming.

The importance of this preliminary "softening up" process to the whole train of events so characteristic of subdivision in the urban fringe is commonly overlooked. But it probably exercises a greater influence in the encouragement of excess subdivision and the dispersion of residential development to all parts of the periphery regardless of adaptation or need, than such things as the activities of high pressure promoters, discussed so frequently in this connection.

Steps in a Remedial Program

In the foregoing analysis attention was directed to the part played by certain features of the local government organization of metropolitan areas in encouraging the wasteful disposition of the land resources in the urban fringe which might easily prove to be of inestimable social value in a post-war era of urban redevelopment. On the basis of this analysis certain minimum changes in governmental organization as well as fiscal administration would seem to be in order.

Perhaps the first step in such a procedure should be the creation of a metropolitan authority on which the responsibility for the adoption and administration of a metropolitan development plan would rest. Many obstacles stand in the way of such a step—the number depending upon the amount of authority to be delegated to such an agency. Obviously it should be more than just a planning board. In this connection it should be mentioned that Portland has a City Planning Commission with authority to pass on the layout of subdivisions platted within a distance of six miles from the city limits. This, however, is the limit of its authority in the fringe and, for that matter, the limit of the authority of the city itself. Beyond that it acts only in an advisory capacity which is entirely insufficient.

There must be power to implement a plan once agreed upon which seems to call for an administrative organization with jurisdiction over the same area. Among other things such an agency must have power to pass and enforce zoning regulations, to administer a public works program and to raise the necessary funds by suitable forms of taxation.

Such an administrative organization could never be effective if it were to operate at cross purposes with established agencies of government such as the central city or the various county governments. As discussed above, this is exactly the situation that must be prevented in the best interests of the entire metropolitan area. It is very doubtful, therefore, whether this unified approach can be accomplished by any administrative arrangement other than one that completely identifies the city government with that of the metropolitan area.

Inclusion in the Portland metropolitan area of parts of three counties introduces additional complications. As described above, certain county functions, particularly the assessment procedure, have an important bearing on land use in the urban fringe. Other county activities such as the treatment of tax delin-

quency, disposition of county owned property, etcetera, would certainly need to be administered uniformly throughout the area of a single metropolitan district. Undoubtedly considerable use would need to be made of zoning, a type of control device which could be used effectively only if the entire metropolitan area were within the political jurisdiction of one county. Such a situation might be brought about in one of three ways: (1) The Portland metropolitan district might become the county of Portland; (2) Multnomah County might be enlarged to include those parts of the other two counties that fall within the metropolitan district; or (3) The three counties might consolidate, whereupon an enlarged city could be formed.

The tendency, described in this paper, for all assessments to be influenced by the potentialities for residential use would certainly need to be curbed both in fairness to owners of property classified as agricultural as well as to remove the pressure to divert to residential use in the case of all vacant land. On the other hand, zoning regulations are not immutable. As time goes on, lands must be shifted from a lower to a higher classification with corresponding changes in land values.

In seeking an assessment procedure that would fit such a situation, consideration should be given to the possibilities of an increment tax to be collected at the time of transfer and to be considered as a supplement to a stabilized annual property tax. Such a device obviates the necessity of a precise forecast of land values which is theoretically necessary if the individual taxpayer is to be treated equitably and, what is equally important, if the socially-created land values of an expanding community are to be returned for the use of the common welfare of the people.

By assessing land on the basis of current income (and not lower than agricultural value in the case of vacant land) much of the pressure to subdivide would be eliminated. Agricultural activities could continue in those areas for which the land is uniquely adapted to that use. Holding land in idleness in anticipation of value increments would also be discouraged by the knowledge that a sizeable proportion of such increment would be taxed away.

Finally, an increment tax offers the possibilities of a more equitable approach to special benefit taxation — a goal scarcely to be attained by special districts with arbitrary boundaries and application of a uniform levy to a questionable assessed value.

Minimizing the practical difficulties in the way of such an innovation in metropolitan finance can serve no useful purpose. The highly charged politics of such communities and the carry-over into state legislatures are well known. For several reasons, action by the state legislature would be necessary in the case of Portland. Like other states, the Oregon constitution contains a uniformity clause stating that "all taxation shall be uniform on the same class of subjects within the territorial limits of the authority levying the tax." (Art. I, Sec. 32) Strictly speaking, the increment or improvement tax is not a *tax*, but a special fee for special benefits. But courts are not clear on this point and in all probability would treat it as a tax, subject to the uniformity clause.

However, the same constitution also contains provisions for Oregon's progressive timber tax law which waives the ad valorem tax on reforestation land while the trees are ripening into marketable timber, and levies a yield tax based on the value of the cut which is collected at the time of sale. The analogy between

this situation and the problem in the urban fringe is close and suggestive. Traditional tax procedures were recognized as responsible for much premature timber cutting and unwise land use. Similar tax procedures are responsible for premature subdivision and unwise use of land in the urban fringe. Statutory changes that would allow for special procedures in metropolitan districts should not be abandoned before being attempted, in view of the success that has been realized in forest taxation.

The structural reorganization in local government suggested above is only a first step toward an integrated approach to metropolitan redevelopment. But it is probably a necessary first step without which the other desirable land-use controls such as tax policy, zoning regulations, etc., could not be expected to function successfully in the best interests of the metropolitan region as a whole.

(At the time this article was written the author was with the Bureau of Agricultural Economics, U. S. Department of Agriculture.)

Kentucky Accepts T.V.A. Power

By ALEX T. EDELMANN *

KENTUCKY is the most recent addition to the growing number of states participating in the consumption of cheap electricity from federal power projects. The 1942 session of the legislature adopted an enabling bill [1] authorizing municipalities to acquire or construct distribution systems for the purpose of purchasing electricity generated by the T.V.A. The issue of public power was by all odds the most controversial in the administration-controlled session. The private utilities and other opponents of public ownership raised the question of states' rights, and the Public Service Commission exerted a strenuous but unsuccessful effort to admit the T.V.A. to Kentucky only on condition that the distribution systems come under the Commission's authority.

The enabling bill was passed to overcome a decision of the Kentucky Court of Appeals [2] on December 20, 1940, that invalidated a contract executed in 1937 between the City of Middlesboro and the T.V.A.[3] The contract was made under the supposed authority of a general act granting cities other than those of the first class the power to acquire and operate electric systems, and vesting in city utility commissions "absolute and exclusive control" over the fiscal management, operations, and rates of the systems. The Court declared that the contract entered into for a twenty-year period and agreeing to a schedule of rates, terms and conditions, and rules and regulations subject to the approval of the T.V.A., was an unconstitutional delegation of powers vested by the state in the municipality. ". . . to place the judicial stamp of validity on the contract involved would be to confirm the voluntary abdication of power with which the legislature has clothed the City of Middlesboro. It would be to approve the assumption or acceptance by the city of complete subjectivity to the domination and control of the federal government through its agency in the management of the city's business without legislative sanction thereof. . . . Until the legislature of Kentucky shall speak an authoritative word . . . the making of such a contract . . . is *ultra vires*." [4]

Although an enabling bill was introduced in the 1940 session to authorize municipalities to contract with the T.V.A., it was not pressed by the state administration pending the outcome of the Middlesboro case. As a result of the Court's decision, however, specific statutory authorization was declared by the Governor to have first place on the legislative agenda of 1942. The State Legislative Council also recommended that needed legislation be passed, although it did not propose any specific measure.

The introduction of the enabling bill immediately evoked vehement and powerful opposition. Opponents of public ownership realized that the T.V.A. could be effectively excluded if Kentucky authorized its entry only on condition that the state directly or indirectly control its operations. Accordingly, the Kentucky

* Assistant Professor of Political Science, University of Kentucky.

[1] House Bill 146.

[2] 146 SW 2d 48.

[3] Annual Report of the Tennesse Valley Authority for the fiscal year ended June 30, 1938, pp. 277-290.

[4] 146 SW 2d 54.

Utilities Company, leading the fight against the bill, insisted that the T.V.A. should not be allowed in the state unless it operated under the same laws as private marketers of electricity. Exempting it from the ordinary control of the state would be special privilege legislation that would deny to the people of Kentucky "their inherent state's right to regulate and control the operations and rates of the utilities that serve them." After warning the people to think long before surrendering their right to govern themselves in every particular, the company declared that "if Abraham Lincoln were living in his native state today, he might well be warning his fellow citizens—'Government of Kentuckians, for Kentuckians, by Kentuckians'." [5]

Argument along these lines gave little heed to constitutional principles. The requirement of the T.V.A. that a state waive control before the Authority extends service was declared to be simply an operating rule that the T.V.A. could easily change.[6] This contention ignored the long-established state immunity of federal agencies, and was oblivious to the T.V.A.'s successful assertion in 1934 and 1935 of immunity from control on the part of Alabama and Tennessee.[7] Another misconception was shown by efforts to interpret the enabling bill as conferring power on the T.V.A. to operate in Kentucky. Its counsel refuted this idea at the public hearing on the bill, noting that "no state can add to or take away the powers granted by Congress to any federal agency." The only power conferred by the bill was that given Kentucky municipalities.[8]

More subtle but less effective opposition to the use of T.V.A. power came from the Public Service Commission that professed friendship for the Authority but was obviously hostile. Without openly opposing the T.V.A.'s entry into the state, the Commission sought to exclude it by insisting on the power to control its operations indirectly. This would be effected through the simple expedient of having the municipal distribution systems under the jurisdiction of the Commission. Its attitude was apparent from the bill that it proposed to the Legislative Council prior to the meeting of the legislature. Municipalities desiring to purchase T.V.A. power would have to secure a certificate of convenience and necessity before being authorized to acquire a distribution system or extend service to new areas. Moreover, the determination of a fair purchase price would be made by the Commission. The T.V.A. directorate criticized these as "joker" provisions that would make public ownership in effect impossible because of the delays and litigation that would be caused,[9] whereupon the Legislative Council agreed to exempt municipalities desiring to contract with the T.V.A. from the jurisdiction of the Commission. In a lengthy appraisal of the bill introduced in the legislature, the Chairman of the Commission advanced various criticisms, all of which might have been met agreeably by the T.V.A. except the basic and revealing charge that the bill would "surrender city rights, liberties and privileges for twenty years . . . in complete abdication of local authority that is unwise, unhealthy and unpatriotic." [10] The

[5] *Lexington Leader*, February 10, 1942.

[6] Cf., the statement of the President of the Kentucky Utilities Company, *Louisville Courier-Journal*, January 28, 1942.

[7] Following attempts of state agencies in both states to control the T.V.A., the legislatures defined federal agencies as "non-utilities," exempt from state regulatory bodies. *Alabama Laws*, 1935, p. 1, and *Tennessee Public Acts*, 1935, Chap. 42.

[8] *Louisville Courier-Journal*, February 4, 1942.

[9] *Ibid.*, December 21, 1941.

[10] *Ibid.*, February 5, 1942.

bias of the regulatory commission was even more conspicuous when it was revealed that the body had asked the Kentucky Utilities Company for assistance in preparing a bill, and that its counsel had responded with a measure in substantially the same form as the one presented by the Commission to the Legislative Council.

Although the objection to the T.V.A.'s entering the state except under the jurisdiction of the Commission was clearly designed to attach a condition impossible of acceptance, other criticisms were made of the proposed bill. Despite a provision intended to replace taxes, it was alleged that the exemption of public power from local taxation would result in a crushing loss of revenue to all levels of government. It was also charged that the municipal power boards had too much authority, since no popular vote was necessary for the acquisition of distribution systems unless twenty-five per cent of the voters demanded it. Moreover, it was held that possible competition between the municipal distribution systems and the rural cooperatives would destroy the whole program of rural electrification.

The combined frontal attack of private utilities, coal interests, and many newspapers was so formidable that an extensive and skillfully organized propaganda campaign appeared likely to succeed. These efforts were greatly aided by the flanking and sniping tactics of the regulatory commission. At the height of the opposition the Governor acted vigorously to fulfill promises made to the Kentucky Municipal League, Kentucky, Public Power League and other bodies that necessary legislation would be passed. He completely repudiated the "yes but" attitude of the Commission, and in a special address to a joint meeting of the legislature,[11] urged immediate passage of the enabling bill. Systematically refuting the various objections raised against it, the Governor declared that those in favor of permitting the T.V.A. to come into the state "if it comes in the right way" were raising a smokescreen of controversy, and that the real issue was whether the communities desiring T.V.A. power should be given the authority to obtain it. The Chairman of the Commission heatedly resigned immediately after the address, declaring, "I don't have to stand insults from anybody."

Administration strategy was then directed to an all-out effort to secure adoption of the bill. The Advisory Highway Commissioners met at the capital and proceeded to arouse sentiment throughout the state by dinners and meetings. Concerted tactics turned the tide, and the final bit of pressure needed to effect a landslide victory was the Governor's keeping a personal tally sheet as the roll was called in each house. As one of the Republican senators remarked in explaining his vote for the measure: "Governor Johnson made a bandwagon and a trailer. Then he uncoupled the trailer and took the tires off. I want to get out of the trailer and onto the bandwagon. I vote 'aye'." Another evidence of administration strategy was the offering of a substitute bill containing certain desired changes as an amendment to the original bill, thereby under the rules preventing any amendment in the House. The pressure applied resulted in adoption of the measure without amendment by an overwhelming vote of 85-10 in the House and 32-6 in the Senate.

The act empowers municipalities and counties to own and operate distribution systems and to contract with the T.V.A.

[11] For a partial text, see *ibid.*, February 12, 1942.

for the sale of power. Each system will be managed by an Electric Plant Board of four members appointed by the mayor and confirmed by the governing body for overlapping terms of four years, and a member of the governing body or the city manager may be appointed a fifth member. Immediate supervision of the system is vested in an electric plant superintendent appointed by the board.

No certificate of convenience and necessity or other authorization is necessary for the acquisition of distribution systems. Moreover, the Public Service Commission has no jurisdiction over the Electric Plant Boards and no authority over the regulation of rates. However, the Commission may require a system to extend its service if this is considered not harmful to its financial structure and in the public interest. The main objections to the original bill were responsible for several significant provisions. Persistent fear of the loss of taxes led to the requirement that contracts with the T.V.A. shall not only establish rates adequate to provide for the replacement of state, county, municipal, and district taxes but also that the payments must actually be made. Kentucky thus becomes the first state in the Tennessee Valley to require the distribution systems to replace county and other taxes. No other state in the area has enacted a general law for the purpose, and the failure of Tennessee in particular has caused unnecessary friction between the cities and counties that has embarrassed the T.V.A. Charges that the original bill vested too much power in the Electric Plant Boards resulted in another provision that before a system can be acquired or constructed, or revenue bonds issued for either purpose, a majority of the qualified voters must approve the action at the next regular November election. Finally, belief that the distribution systems would compete with the rural electric cooperatives was removed by a specific prohibition against such competition.

Consumption of T.V.A. power became a reality when an agreement was negotiated on June 11 between the Kentucky-Tennessee Light & Power Company and the T.V.A. transferring certain properties to public ownership. Paying $3,538,000 for the properties, the T.V.A. acquired and retained the generating and transmission facilities, valued at $942,500, and transferred the distribution systems to five Kentucky towns and four rural cooperatives. The transfer was followed by an immediate reduction of 20 per cent in rates to residential consumers and approximately 10 per cent to industrial consumers.[12]

Authorization of the use of T.V.A. power will have far-reaching effects both on the public power program and on Kentucky. The Wolf Creek Dam, an extensive power and flood control project that will cost approximately $55,000,000, is under construction on the Cumberland River by army engineers. The inclusion and development of the Cumberland under the T.V.A. have long been urged,[13] and the increasing wartime demand for power and future consumption by Kentucky will stimulate efforts to accomplish this. The Kentucky Dam now being constructed as part of the T.V.A. system is scheduled for completion in 1944, when electricity will be available for the state. Cheap power is estimated to save at least $7,000,000 a year and will enable Kentucky to compete industrially with other Tennessee Valley states.

[12] *Ibid.*, June 12, 1942.

[13] As in Hearings before a Subcommittee of the Committee on Agriculture and Forestry, U. S. Senate, 77th Cong., 1st Sess., to include the Cumberland River Basin in the T.V.A. (June-July, 1941).

Urban Land Department

Toward Post-War Planning for Yorkville

YORKVILLE, part of the borough of Manhattan, is one of the many local communities within New York City. In that part of Yorkville which faces Central Park with its acres of grass and trees, live some of New York City's wealthiest families. In the past, these families were housed in elaborate stone mansions; today the single-family dwellings have to a large extent been replaced by imposing high-rental elevator apartments. These Fifth Avenue dwellings, extending from Sixty-third to Ninety-first Streets, constitute the western edge of the community of Yorkville. Not far from Fifth Avenue, in the vicinity of Madison and Park Avenues are found an area of expensive shops, residential hotels and high-rental apartments.

Moving toward the East River, an observer is aware of a decided change in the character of the neighborhood. The elevator apartments are less pretentious and less numerous. East of Third Avenue stand block after block of dingy five- and six-story dwellings; these are the slums of Yorkville.

Continuing on toward the East River an observer reaches that new feat of engineering, the East River Drive. Automobiles move rapidly north and south along the new roadways located at the eastern edge of the community of Yorkville.

What the traveler sees in Yorkville are the contrasts, the homes of the poor and the well-to-do, sometimes in proximity, at most but a few blocks apart. What he cannot discern is the host of variables that contribute to conditions as he finds them. The purpose of this study is to present a picture of social and economic conditions in Yorkville — the heterogeneous factors that are responsible for the Yorkville of today and that must be modified to achieve the planned community of tomorrow. The following analysis focuses attention on those sections of the community where conditions are most sub-standard and makes recommendations for post-war rehabilitation in Yorkville.

Boundaries of Yorkville

For the purposes of this study, Yorkville is that part of Manhattan which extends from the north side of Sixty-third Street to the south side of Ninety-first Street, and from the east side of Fifth Avenue to the East River. The arbitrary boundaries which have been adopted may be challenged. Without a doubt, the boundaries of any community are not determined by lines drawn on a map but rather are based on interest groupings and on cultural patterns. However, if those sociological measurements had been used to determine the Yorkville area, the result would be a community of irregular boundaries for which statistical data would not be readily available. For purposes of analysis, therefore, outlines of Yorkville which coincide with the boundaries of *health areas*[1] used by the New York City Health Department and

* "The name (Yorkville) would suggest that the settlers or squatters (about the year 1685) were of English rather than Dutch blood. . . . Were they dazzled by the glory of the Duke of York, later James II, the friend and patron of Dongon, the first governor of the colony? It is hard to say — Yorktown would have suited them better; but Yorktown had been preempted by the pioneers of Virginia, so perforce Yorkville became the name of the village on the Post Road between the Dutch settlement of Harlem and New Amsterdam." P. J. Dooley, *Fifty Years in Yorkville*, (Parish House, 1917), pp. 5-6.

[1] *Health areas* are standard geographical units, aggregations of census tracts, each having a resident population of approximately 25,000 persons. *Census tracts* are the smallest local areas for which data are compiled by the United States Census. Inasmuch as the territory included in a census tract is sometimes too small to be used in the presentation of certain types of data, the health area is more effective for some purposes as a statistical unit than is the census tract.

the Welfare Council of New York City have been adopted.

Lack of homogeneity in the social structure of Yorkville makes it extremely impractical to study it as a whole. It has therefore been divided into two sections: the area east of Third Avenue, which includes five health areas and ten census tracts; and the area west of Third Avenue, which includes two health areas and eight census tracts (Cf., Map of *Health Areas and Census Tracts*). These two large sections, designated as the East and the West areas, show marked contrast in land planning and zoning regulations, in types of housing accommodations, and in the characteristics of the residents.

*I. Land Planning and Zoning in Yorkville**

An early map of Manhattan shows that in 1609 a stream, with its sources at the east side of Central Park, ran through Yorkville at what is now Seventy-fourth Street. Two swamps at about Ninety-first Street formed the northern boundary of Yorkville. The stream and swamps have long ceased to exist. As a result, today Yorkville is not characterized by abrupt elevations or depressions. Instead, the land rises gradually from the East River to the highest section 105 feet above sea level, in the northwest area at Ninety-first Street. The lowest land in the community is along the East River frontage. In the vicinity of Central Park at Sixty-fifth Street the elevation above sea level is only 55 feet.

Land Utilization

Land utilization in Yorkville, or any community, may be roughly classified as *open space, residential,* and *non-residential.* Data on the amount of land used for each of these purposes are available in the Community Planning Study, Area 14, 1936, part of a project of the Mayor's Committee on City Planning, New York City. The boundaries of Area 14 do not entirely coincide with those of the census tracts included in Yorkville as defined in this analysis.[2] However, since no land-use study was available for the latter, the former has been used as the source of most of the data included here. (Cf., Table I.).

Open Space

Streets. The Manhattan rectangular street plan was adopted in the early part of the eighteenth century.[3] Because at that time the burden of traffic occurred between the Hudson and East Rivers, many streets were planned to run east and west but relatively few to run north and south. But the automobile brought a rapid growth in traffic moving in these directions so that today the number of north-south avenues is inadequate. Because of this standardized rectangular plan of street development, about 36 per cent of the gross acreage in the Yorkville area is utilized as avenues and streets.

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* This section of the study is the first of four. The other three will analyze population structure and housing conditions and will appear in subsequent issues of this Journal.

[2] The area covered by the Mayor's Committee on City Planning in the Community Planning Study, Area 14, extends from Fifty-seventh to Ninty-first Streets. The boundaries of Yorkville, for the purposes of this study, however, are Sixty-third and Ninety-first Streets. Because the Yorkville of this study, about 789 acres, constitutes about 68 per cent of the territory included in Community Planning Study 14, the percentages in the Study 14 are assumed to be representative of this smaller Yorkville. A further justification of the methodology exists in the fact that the additional area from Fifty-seventh to Sixty-third Streets includes a continuation of the same types of land usage as the territory embraced in the smaller Yorkville of this study.

[3] The restangular plan of Manhattan covering the area north of Fourteenth Street to 155th Street was filed March 22, 1811, and confirmed by the state legislature in the same year. The nine avenues running north and south are wider than the twenty-eight streets running east and west. Avenues are generally 100 feet or over in width, measured from lot line to lot line, whereas the standard width for streets is 60 feet. In the Manmattan street plan, in order to care for traffic, some east and west streets were planned wider than the standard 60 feet. In Yorkville, Seventy-second, Seventy-ninth and Eighty-Sixth Streets are each 100 feet in width. Sixty-foot streets have 13 to 15 feet on each side, allocated to sidewalk use, leaving 30 to 34 feet available for roadway. Sidewalks on Seventy-second and Seventy-ninth Streets are 30 feet wide on each side, allowing only 40 feet for vehicular traffic.

TABLE I. GROSS ACRES OF LAND AND PERCENTAGE DISTRIBUTION IN EACH TYPE OF USE*

Type of use	Gross acres of land	
	Number	Percent
Total acres	1157.5	100.0
Open space	450.9	39.0
Streets	419.0	36.2
Parks	17.9	1.6
Vacant lots	14.0	1.2
Residential structures	502.8	43.4
Single family	67.0	5.8
Two-family	3.9	0.3
Multi-family	406.7	35.1
Boarding houses, lodging houses and hotels	25.2	2.2
Non-residential	203.8	17.6
Business	72.1	6.2
Industry	36.6	3.2
Public buildings	25.7	2.2
Private institutions	69.4	6.0

* Source: Community Planning Study 14, 1936, Mayor's Committee on City Planning, New York City.

East River Drive Improvement. Some additional land has been added in Yorkville as a result of the extension of the East River Drive.[4] No part of the Drive is less than 32 feet in width, or the equivalent of three lanes for automobile traffic; in some sections it is twice that width, or more.

At the narrow sections of the drive, where the area between the lot lines and the bulkhead line is small,[5] a double-decked driveway has been built. The upper lane is used for northbound and the lower lane for southbound traffic.

Streets Used for Transportation. Yorkville is served by five bus systems, one street-car line, one elevated line and a subway — all under franchises from the city.

The oldest of the bus systems, the Fifth Avenue Coach Company, came into existence in 1880, obtaining the right from the legislature of New York State to operate horse-drawn vehicles from Eighty-ninth Street to Washington Square. The one street-car line which has not been supplanted by buses is that of the Third Avenue Railway System, running on Third Avenue and connecting with its own line across Forty-second Street.

The elevated line on Third Avenue and the Lexington Avenue subway, operated by the Interborough Rapid Transit Company, has been taken over by the City since 1940 as part of a consolidation program. A ferry from Seventy-eighth Street is operated by the Department of Hospitals to give access to Welfare Island.

To what extent are these transportation facilities adequate? The New York State Transit Commission reports (November, 1942) that the subway has reached its maximum capacity during the peak hours. However, the majority of the passengers were merely traveling through Yorkville in order to reach working establishments and homes in other sections of New York City. Actually, between 1933 and 1941, a decrease occurred in the number of passenger fares collected at the stations of the Lexington Avenue Subway located in Yorkville (from 24,629,292 fares in 1933 to 22,375,583 fares in 1941).[6] The same general trend was indicated in the passenger fares collected in Yorkville for both the Second and Third Avenue Elevated lines from 1933 through the year 1939. Since the Second Avenue Elevated was closed in June, 1940, and has since been razed, data are now available only for the Third Avenue line. These show a small increase in 1941 compared with 1933.

The number of buses servicing the community varies during the day. In rush hours buses are only one-half minute apart; in non-rush periods four to ten minutes apart. Since the population of Yorkville remained relatively stationary between 1930 and 1940 (an increase of less than 3 per cent, or 4,373 persons), changes in passenger fares have not been influenced by this factor.

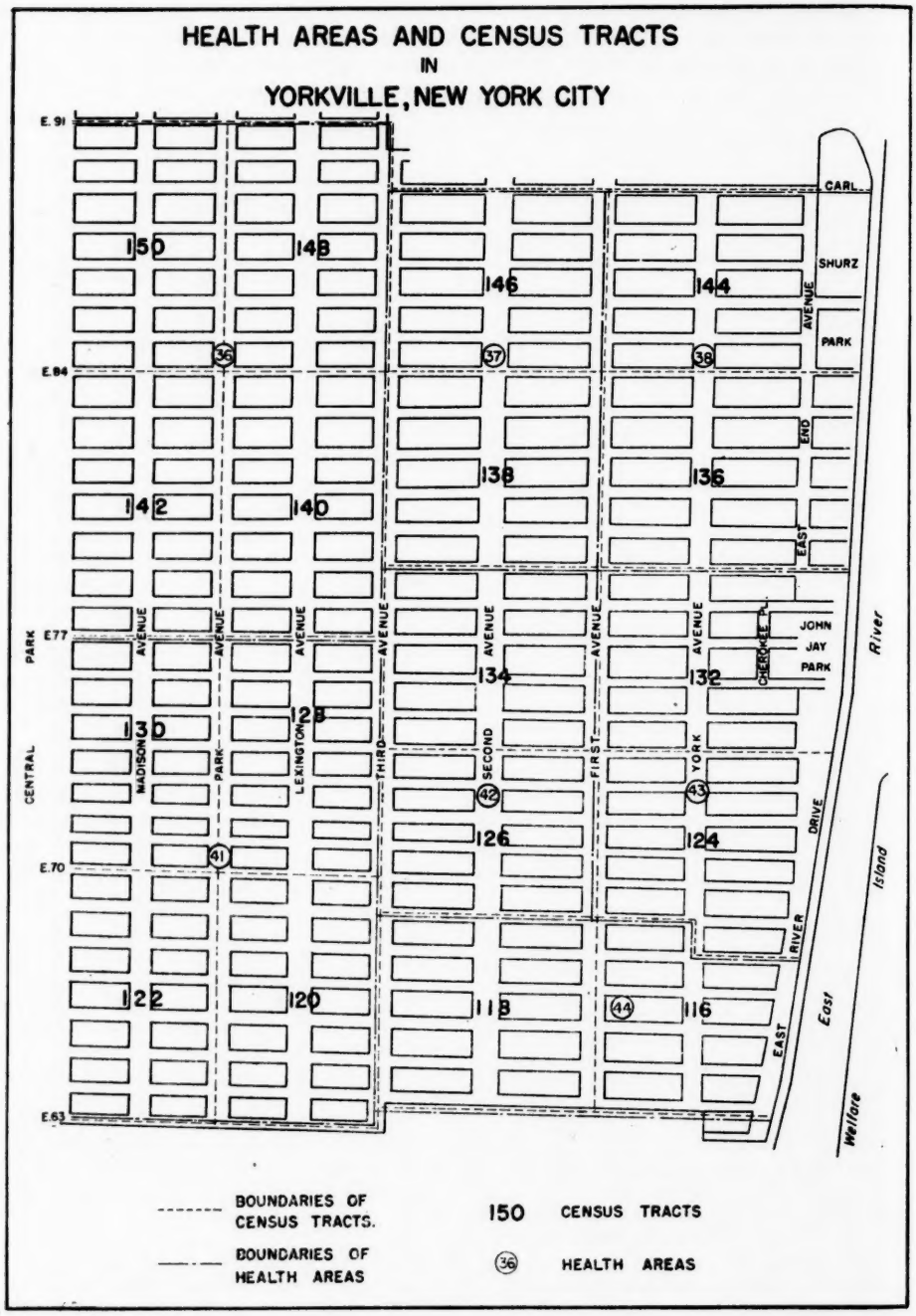
Parks and Playgrounds.[7] Park space in Yorkville is a very small percentage of the gross acreage (approximately 1.6 per cent).[8] New York as a whole has about 5.3 per cent of its total area in parks.[9]

[4] An East River Drive has been in existence for some time above Ninety-third Street. The recent improvement is an extension of this drive from Ninety-third Street south to the Battery.

[5] The bulkhead line is that point in the river, established by the United States Government, to which fill may be added, thus producing made land.

[6] Data from the files of the Board of Transportation, New York City, November, 1942.

(Footnotes 7, 8, 9 see page 489)


HEALTH AREAS AND CENSUS TRACTS
IN
YORKVILLE, NEW YORK CITY
E. 91
E. 84
E 77
E. 70
E. 63
CARL
SHURZ
PARK
AVENUE
END
EAST
JOHN
JAY
PARK
CHEROKEE PL
PARK AVENUE
CENTRAL
MADISON AVENUE
PARK AVENUE
LEXINGTON AVENUE
THIRD AVENUE
SECOND AVENUE
FIRST AVENUE
YORK AVENUE
EAST RIVER DRIVE
East River
Island
Welfare
150
148
146
144
142
140
138
136
134
132
130
128
126
124
122
120
118
116
36
37
38
41
42
43
44
BOUNDARIES OF CENSUS TRACTS.
BOUNDARIES OF HEALTH AREAS
150 CENSUS TRACTS
(36) HEALTH AREAS

The park space for Yorkville in 1936 (17.9 acres) did not include that of Central Park, which forms the western boundary of Yorkville, nor the added park space of the East River Drive. Since Central Park, however, is more accessible for daily recreation to the people living in the west area of Yorkville, families in the east area depend largely on the neighborhood open space for recreation. Using the generally accepted although somewhat inadequate standard of one acre of park and playground space to every one hundred inhabitants, Yorkville's 17.9 acres would have been sufficient for only 1,790 persons.[10] In the east area, which lacks park space, there were about sixty times as many persons, approximately 104,700, both in 1930 and in 1940. For the great majority of these there is today, as in 1936, no provision for park space in proximity to their homes.

The park and playground space in Yorkville is concentrated along the East River. Since playgrounds for small children have a limited area of effectiveness, usually based on walking distance from the home to the park – a radius of about one quarter mile – a glance at the map of Yorkville shows large residential areas in which young children have no access to playgrounds.

Parks along the river at Fifty-sixth, Fifty-seventh and Fifty-eighth streets are built at high level on the roof of the drive which is double-decked at these points. Similarly, in the Carl Schurz Park area where the drive is also double-decked, the roof of the upper deck is used for promenade purposes. The level of this park has been raised a few feet to meet that of the promenade. Such developments were possible because at those points the land adjoining the East River is as much as thirty-five feet or more above water level; in contrast, the drive which is built on made land has both traffic lanes or, where it is double-decked, the lower roadway close to the water level of East River.

Between some of the parks, the roof of the drive has been converted into private gardens for apartment houses fronting on the river.[11] These spaces were paid for by the owners of the apartment houses. The result has been a marked improvement in the character of the use of the land along the water front. Should this spread to adjoining areas, the occupants of the present low-rental houses in proximity to the East River will either move out of Yorkville in search of cheaper housing or move into present sub-standard housing areas not affected by the East River Drive improvements. The latter will lead to further housing congestion in the interior of the community of Yorkville.

A deterring factor to the assemblage of land for park purposes in Yorkville is high land cost. In the west area, assessed valuations (1941) ranged from $700 at Ninety-second and Ninety-third Streets between Second and Third Avenues to $5,200 a front foot at Seventy-second, Seventy-ninth and Eighty-sixth Streets. In the East area, assessed valuations (1941) ranged from $340 a front foot on Seventy-third, Seventy-fourth and Seventy-fifth Streets near the

[7] Park space in Yorkville may be classified as *small parks, large parks* and *playgrounds*. The *small parks*, covering 3.2 acres, are located for the most part along the East River, i.e., the Marie Curie Park at Sixty-third Street and the East River Drive plots or open spaces. The *large parks*, Carl Schurz and John Jay in the northeast section overlooking the East River, and St. Catherine in the southeast, together account for about 13.7 acres. The construction of the East River Drive has added two small sections of land to Carl Schurz Park since 1940. In 1936, Yorkville had only one playground, covering 1.2 acres. In 1938, a *permit playground* came into existence on 1.4 acres of land which was leased by the Department of Parks from the Rockefeller Institute for Medical Research. In June, 1941, New York City reopened a playground on 1.4 acres of ground owned by the city. The lease for a *permit playground* may be revoked by the owner if he gives the city thirty, sixty, or ninety days' notice – depending upon the nature of the agreement.

[8] Gross acreage includes the total area without a deduction for streets.

[9] "Regional Plan of New York and Its Environs," *Public Recreation*, Vol. V, 1928, p. 39.

[10] "The old standard of one acre (of park and playground space) to every 100 inhabitants is not only very conservative, but in reality too low." Quoted from L. H. Weir, *Planning Foundation Bulletin*, p. 7, 1929.

[11] To obtain space (for the East River Drive) at Fifty-eighth Street, the city had to demolish the home of Lillie Harriman Havermeyer and pay her a sum sufficient to rebuild it on the deck of the roof of the Drive. She received a deed to the roof, directly north of Fifty-eighth street. From New York *Herald-Tribune*, April 11, 1940, p. 25.

East River to $4,000 on East Eighty-fourth Street, also near the East River but facing Carl Schurz Park and Gracie Square. The cheapest land in any block in Yorkville cannot be assembled under approximately seven or eight dollars a square foot.[12] At this price, no matter how essential parks are, the practical question is how are they going to be financed?

Residential Structures

Relatively more space is devoted to residential purposes in Yorkville than for any other use – about 43 per cent of the gross acreage (502.8 acres). The relatively high proportion of the gross area used for housing in Yorkville is explained by the fact that it is not an independent urban community but an important residential section of a large urban center.[13]

In 1936 multi-family dwellings covered about 35 per cent of the gross acreage of the Yorkville area, single-family dwellings less than 6 per cent, two-family dwellings only 0.3 per cent and boarding houses, lodging houses and hotels the remaining 2.2 per cent of the land used for residential purposes. These data are in agreement with the figures given in the Real Property Inventory. These figures indicate that in 1942 multi-family dwellings far exceeded any other type of residential structure.

Non-Residential Use.

Business. In 1936 business occupied 6 per cent of the total gross acreage in Yorkville, as defined by Community Study 14. Garages and filling stations, which are numerous near the East River, occupied a little less than one-half the total business area of 72 acres. Stores took almost 7 acres, including the neighborhood shops, exclusive general shopping center on Madison Avenue and East Fifty-seventh Street, and one large department store, Bloomingdale's. In the Fifty-seventh and Fifty-ninth Street areas, office buildings covered about 5 acres.[14] The 21 acres remaining were distributed among miscellaneous business uses.

Industrial Use. Three per cent of Yorkville's gross area as defined in the Mayor's study – about 36 acres – was used for industrial purposes largely located in the east area. About one-fourth of this space was occupied by the food and beverage industries, which included a large brewery. An additional one-quarter of the area was used for power plants. Along the waterfront were found a few industries, such as coal pockets, requiring water transportation. Recent improvements along the East River and relatively high land values are forcing industry to move to other sections of the city.[15]

Public and Private Institutions. Public and private institutions in Yorkville serve not only the immediate community but the whole of New York City. In 1936, 8 per cent of the gross acreage – 96 acres – or as much as business and industry combined, was used for public buildings.

In 1936 these included 50 elementary and secondary schools, one public municipal college, and 54 church buildings (7 Synagogues, 18 Catholic and 29 Protestant churches). In addition, there were libraries, police stations, homes for the aged, day nurseries and a museum. Certainly Yorkville's 13 hospitals, Rockefeller Institute and 2 armories serviced not just the immediate community but the larger metropolis of New York City.

Zoning in Yorkville

Yorkville is subject to the New York City zoning ordinance of 1916 as amended.[16] This includes three major sections within which are found use, height, and area (land coverage) regulations.

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[12] *Tentative Land Value Maps of the City of New York for Fiscal Year July 1, 1941 – June 30, 1942.* Prepared by Tax Department, February 1, 1941.

[13] In the study of New York areas by the Mayor's Committee on City Planning, 1936, the average gross acreage used for residential purposes was 30 per cent.

[14] Summary of Report of Mayor's Committee on City Planning, *Draft of Report on Yorkville,* 1936 (unpublished).

[15] *op. cit.*

[16] *Zoning Resolution of the City of New York,* as Amended by the City Planning Commission and Modified by the Board of Estimate, Effective June 28, 1940.

Use Regulations

(1) Residential. The major part of the area west of Third Avenue is designated as residential. Under the New York zoning ordinance, only certain specified uses of land are permitted in a residential district, i.e., dwellings, clubs, churches, schools, etc. Because of the preponderance of multi-family housing in New York City, the law makes no provision for various types of residential uses, i.e., a classification of areas into one-family, two-family and multi-family dwellings.

Although a large proportion of the area west of Third Avenue has been designated as residential, only about fifteen blocks east of Third Avenue, in the vicinity of Carl Schurz Park, are so classified (Cf., map of *Zoning Regulations in Yorkville,* New York City). Proximity to the park and the fact that there is a concentration of high-rental elevator apartments in this vicinity undoubtedly have some influence in determining the residential classification for this small section.

(2) Business. The area zoned as business in Yorkville is concentrated largely in the east section. In the west section, both sides of Lexington Avenue are designated as "business". In the zoning ordinance, the business area is described largely in terms of prohibited uses. Some of the excluded trades or industries are (a) ammonia manufacturing, (b) brewing or distilling of liquors, (c) cremating, (d) fat rendering, (e) fertilizer manufacturing, etcetera. Uses generally prohibited in a business area are those which are noxious or offensive by reason of the emission of odor, dust, gas or excessive noise.

More than one-third of Yorkville is zoned for business, an area located primarily between Lexington and First Avenues. Since in 1936 business uses absorbed only 6 per cent of the Yorkville area and since a trip through the section today indicates that it is primarily residential, it is evident that this part of New York City is no exception to the rule that zoning has provided generally for much more business area than population can support. In addition, inasmuch as Yorkville's population decreased by 21 per cent between 1920-1930 (42,191 persons) and increased by less than 3 per cent in the following decade (4,373 persons) there is little present indication that increasing population demands are likely to bring about expanded business uses.

(3) Restricted retail use. This particular amendment of the zoning ordinance, adopted June 4, 1937, with the advocacy of the Fifth Avenue Association, changed Madison Avenue from a retail district to a restricted retail district. In a retail district the same regulations apply as are provided for a business district except that no manufacturing is allowed other than that which is incidental to the operation of a retail business and is conducted on the premises. In a restricted retail district such uses as theatres, motion picture theatres, cabarets and public dance halls are prohibited. It is possible that the construction of two newsreel theatres just prior to 1937 was partially responsible for the action of the Fifth Avenue Association.

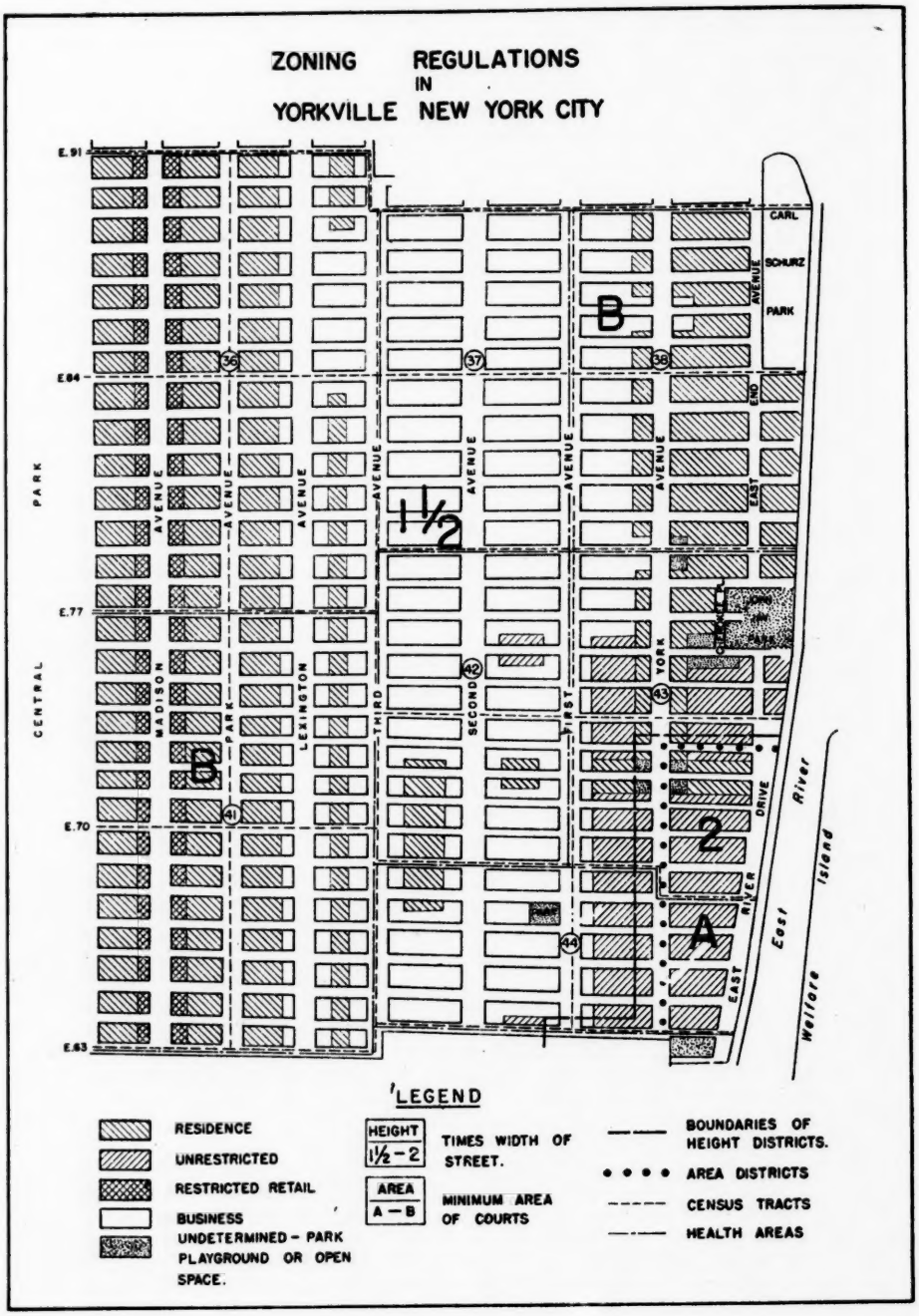
(4) Unrestricted use. The southeastern section of Yorkville is classified as unrestricted, which means that in this section no zoning regulations or restrictions are provided. Therefore, any type of use, including heavy industry, is permitted. Data in the housing section of this report reveal a concentration of sub-standard housing in the area.

Height Regulations Under City Ordinance

The New York City Zoning ordinance has eight height classifications. Height regulations vary from one-quarter the width of the street on which the building faces to two and one-half times the width of the street.

Since the standard width for streets in New York is 60 feet measured from lot line to lot line including sidewalks, this regulation allows buildings to reach a height of 90 feet, the equivalent of about a nine-story building before the cubical content of the upper stories of the building must be reduced through use of set-backs.

Buildings in Yorkville can, for the most part, be constructed to a height equivalent to one and one-half times the width of the street (the sixth classification in the zoning ordinance) before a set-back is required.


ZONING REGULATIONS
IN
YORKVILLE NEW YORK CITY
E.91
E.84
E.77
E.70
E.63
CARL SCHURZ PARK
AVENUE
END
EAST
PARK
MADISON AVENUE
PARK AVENUE
LEXINGTON AVENUE
THIRD AVENUE
SECOND AVENUE
FIRST AVENUE
YORK AVENUE
CENTRAL
B
1½
B
2
A
EAST RIVER DRIVE
East River
Wallabout Island
36
37
38
41
42
43
44
LEGEND
RESIDENCE
UNRESTRICTED
RESTRICTED RETAIL
BUSINESS
UNDETERMINED – PARK PLAYGROUND OR OPEN SPACE.
HEIGHT 1½ – 2 TIMES WIDTH OF STREET.
AREA A – B MINIMUM AREA OF COURTS
BOUNDARIES OF HEIGHT DISTRICTS.
AREA DISTRICTS
CENSUS TRACTS
HEALTH AREAS

Regulations for set-backs vary with the neighborhood.[17] For a large part of the land in Yorkville, the New York City Zoning ordinance states that for each one foot that the building or a portion of it is constructed back from the street line, three feet may be added to the height limit of such building or such portion thereof. It would therefore require a set-back of at least three feet in the one and one-half height regulation applicable in Yorkville, to provide for an additional story in the plan of the building. On the one hand, this provision requires a reduction in cubic content in the upper stories of tall buildings, thus allowing sunlight to penetrate into the street. On the other hand, by the use of a number of set-backs, Yorkville and other sections of Manhattan may build in the future, as they have already done, some residential skyscrapers. The regulation regarding set-backs is responsible for Manhattan's towers and irregular skyline.

Land Coverage Regulations

For the purpose of regulating and determining the area of yards, courts and other open spaces, the City of New York has established ten types of districts, known as A, B, C, D, D-1, E, E-1, F, F-1 and G areas. A small section of southeastern Yorkville between New York and the East River Drive (health area 43) is classified as an A district. The regulations with regard to courts in an A district are few – the minimum area of a court must be in the proportion of one inch of court area to one foot of building height. This would permit a building ninety feet high to have a court of only seven and one-half square feet.

Almost all of Yorkville is classified as a B area district. In this classification the restrictions are more rigorous than in an A district but still insufficient for light and air. For example, the area of a rear yard in a B district must contain at least two inches instead of one for each one foot of the height of the building. Thus if a building were ninety feet in height, the rear yard would be fifteen feet square. Additional restrictions exist in a B area district for rear yard, side yards and outer courts in that area.

The regulations found in the C, D, E, F and G districts, none of which are applied to Yorkville, provide for more open space than is required in the A and B districts. Thus the area regulations applicable to Yorkville are minimum.

Land-use Planning for Yorkville

Today Yorkville, like the rest of Manhattan, is an area of densely populated rectangular city blocks. The most economical utilization of land for housing is not possible with the rectangular plan of street development and streets of uniform width which attract traffic into residential areas, thus creating traffic hazards for children. Current recommendations for street planning are narrow streets to service only the houses in a residential area and wide streets planned for through traffic around the edges of the residential sections of the city. To accomplish this in Yorkville would necessitate complete revision of the present borough-wide standard rectangular street system, an objective obviously not practical. However, when in the post-war era sections of Yorkville are rehabilitated for residential uses, replanning of streets to meet specific needs can be effected within these areas.

Present high land costs act as retarding factors in the assemblage of sites for park purposes. Despite this obstacle new parks and playgrounds for Yorkville are absolutely essential. It is recommended therefore that post-war planning provide for these new neighborhood park and playground spaces and that, if necessary, the city make use of the powers of condemnation and excess condemnation, if need be, to effect the desired objectives. Increased use of excess condemnation might prove to be one possible solution to the problem of scarcity of parks and playgrounds in Yorkville. The creation of a park invariably increases the values of adjacent parcels of land. Control of the land in proximity, i.e., leasing or selling it, would enable the city to benefit from some of the increases in land values resulting from the park improvement. Income from these sources

[17] Two small areas in Yorkville, one in the northeastern section and one in the southeastern, allow buildings to be built to twice the width of the street (120 feet if the street is the standard width of 60 feet) before set-backs are necessary.

could be used to finance the assemblage of land for new park and playground uses in Yorkville and would tend to make such improvements practicable despite high initial land costs.[18]

It has been pointed out that the New York City zoning regulations with regard to use of land, height of buildings and area of the site to be covered by building structures apply to Yorkville as part of New York City. These regulations for Yorkville, like those for the city as a whole, are in many instances obsolete. It is recommended that the zoning regulations applicable to Yorkville be completely revised.

The prevailing height regulations allow structures in most sections of Yorkville to be built to eight or nine stories before setbacks are required and in southeastern Yorkville to eleven or twelve stories. Yorkville has the least restrictions possible under the current zoning ordinance with regard to area, i.e., restrictions with regard to open space are relatively few; provisions require only small yards and courts. These, coupled with the generous height regulations, enable buildings to cover large proportions of the lot areas with little consideration for light and air. In other words, present height and area restrictions are sufficiently lax to allow land overcrowding in all sections of Yorkville. To provide residents with increased light and air, all parts of the community should have more rigorous height and area restrictions than are in force at present.

Large sections of the east area which are in residential use are zoned as unrestricted, subjecting the inhabitants to the disadvantages of non-residential uses, which may include even heavy manufacturing. Since Yorkville is not an isolated urban community but is primarily a residential section of New York City, more of its land is used for residential structures than is true of most self-contained urban communities. That most of this housing is located in areas classified as business or unrestricted constitutes a primary indication of the inadequacy of the zoning regulations.

It is recommended that a large proportion of the land now designated as business or unrestricted should be zoned as residential, entirely feasible under its present use and in view of the apparent decline in population within the last two decades both for Yorkville and for Manhattan as a whole.

ROSALIND TOUGH
Assistant Professor of Sociology,
Hunter College, New York City

SOPHIA M. ROBISON
Senior Analyst,
Office of Civilian Defense,
Washington, D. C.

[18] The right of a government to take land with compensation for a public use such as a park is well established, i.e. through condemnation proceedings. In addition, under an amendment to the constitution of New York State, "the Legislature may authorize cities and counties to take more land and property than is needed for actual construction in the laying out, widening, extending or relocating parks, public places, highways or streets; provided, however, that the additional land and property so authorized to be taken shall be no more than sufficient to form suitable building sites abutting on such park, public place, highway or street. After so much of the land and property has been appropriated for such park, public place, highway or street as is needed, therefore, the remainder may be sold or leased." Constitution of New York State 1895 as amended Nov. 2, 1937, Article 1, Section 7 *(Eminent Domain)*.

Current Sources of Data for Planning and Housing

Much is being written just now which is of significant interest in the field of urban land planning and housing. The next issue of this *Journal* will include at least three manuscripts which comment upon and evaluate recently released sources of data in the field. These are comments by Carrie Maude Jones, Librarian, of the National Association of Real Estate Boards, on "Urban Planning and Public Opinion" which is a recent study by the Bureau of Urban Research at Princeton University; notes by Harold M. Mayer, of the Chicago Plan Commission, on the Chicago Land-Use Survey, – the result of three years' work; and also there will be an item from the Bureau of the Census on the housing survey.

Land Resources Department

County Land as a Factor in Adjusting the Agriculture of Western North Dakota

MANAGEMENT of county-owned land presents a major problem in western North Dakota as it does in most areas of the Great Plains. In many counties, the largest single holder of land is the county government. A report completed in late 1940 revealed that 16 of the 53 counties in North Dakota owned more than 50,000 acres each. Three counties owned in excess of 150,000 acres each. All but one of the 16 counties were located in the western half of the state. At the time of the study, North Dakota counties owned 2,154,773 acres of which 1,588,822 acres were located in the 26 western counties.[1]

As is indicated by the situation in Mountrail County, the acreage of county-owned land at any specified time does not give a complete picture of the volume of the real estate operations carried on by county governments (cf., Table I). Acquisition of land by tax deed action and the day-to-day sales of land result in a situation that is constantly changing. The acreage shown as "acres put on tax paying basis" includes the land sold outright by the county, that redeemed by former owners in order to stop tax deed action, and that redeemed by individuals who secured quit claim deeds from the former owners. In many redemption cases, the delinquent taxes are being paid up through a tax contract. So much of the tax delinquent land in many North Dakota counties is under tax contracts that information on tax delinquency is of little value in giving a picture of potential county-owned land. A tax contract involves an agreement to pay the delinquent taxes in annual installments over a specified period of time. The original act provided for a six-year-payment period[2] but the act was later changed to provide for extending the payments over a period of ten years.[3] All provisions for such tax contracts expired on December 1, 1941, but contracts entered into before that date will be valid for the period specified unless cancelled by the county commissioners for delinquency.

TABLE I. TAX DEED LAND ACQUIRED, REDEEMED AND SOLD, MOUNTRAIL COUNTY, NORTH DAKOTA, 1940-41.

Acres owned by Mountrail County, January 1, 1940	116,773
Acres on which tax deed action was started during 1940	138,976
Total acres	255,749
Acres put on tax paying basis during 1940	71,556
Acres owned by Mountrail County, January 1, 1941	184,193
Acres on which tax deed action was started during 1941	169.754
Total acres	353,947
Acres put on tax paying basis during 1941	189,003
Acres owned by Mountrail County, January 1, 1942	164,944

Source: Mimeographed annual summaries prepared by M. L. Glarum, County Auditor, Mountrail County, North Dakota.

In addition to the land disposed of in 1940 and 1941, Mountrail County sold 30,008 acres between January 1 and April 1, 1942. The 290,567 acres of land sold by Mountrail County during the period from January 1, 1940 to April 1, 1942 represents 23½ per cent of the land area of the county which passed through the hands of the county government during that 27 months' period. Other counties in the Great Plains are experiencing the same situation.

The methods used in disposing of the large acreages of land acquired each year

[1] *Publicly-Owned Land and Related Factors in North Dakota*, 1940, Work Projects Administration, O.P. No. 665-73-3-65, Sponsored by the North Dakota Resources Advisory Board and the North Dakota State Tax Commissioner.

[2] Contract Settlements of Delinquent Taxes, Laws of North Dakota, 1937, Chapter 240.

[3] Adjustment of Delinquent Taxes, Laws of North Dakota, 1941, Chapter 273.

by county governments could be an important factor in solving many problems of inadequate farm units and improper land use. A definite program of selling county land to bona fide farm operators who could use it in blocking out adequate units would make possible many adjustments in the agricultural economy of a county. Planned sale of such a large acreage of land as was disposed of by Mountrail County in 1940 and 1941 could do much to eliminate inadequate units in the county. In view of what could be accomplished through a sound program for the disposal of county land, it seems desirable to consider how the counties are using the important tool they have available.

Present Policy

Policy with respect to management and disposition of county land in most counties seldom goes beyond a determined effort to sell as much land as possible. The desire to return land to the tax rolls as rapidly as possible is understandable in the light of the financial difficulties of many counties. The fact that the only aim involved in county land sales is the securing of additional revenue for immediate use eliminates much possibility of achieving basic long-time adjustments. An aggressive sales policy plus the most favorable moisture conditions of recent years and the general rise in farm prices are not conducive to the orderly marketing of land.

It is interesting to consider the land sales policies of three neighboring counties in western North Dakota. Mountrail County, previously referred to, has established a basic price of one dollar per acre on all land plus three dollars per acre for any cropland on the tract. Thus, a 160-acre tract consisting entirely of grazing land could be purchased for $160 and a tract of the same size consisting of 100 acres of cropland and 60 acres of grazing land could be purchased for $460. The success of this policy, *as measured by the amount of land sold,* is indicated by the data previously presented (Table I). Whether or not the land will *stay sold* is another consideration. In addition to the sale of county land, Mountrail County has given considerable attention to the making of long term leases on county-owned grazing land. As of April 1, 1942, 25,053 acres of county-owned grazing land were under 10-year leases at a rate of $15 per quarter section per year.

The sale price of county-owned land in Williams County is fixed by an appraisal of the county commissioners for each tract. County land cannot be sold at less than the appraised value. The price fixed on grazing land is usually justified but the appraised value of cropland is often greater than is warranted by the income-producing possibilities of the land over a long period. Williams County has also entered into long-term leases on grazing land. In addition, the county sold 14,413 acres to the federal government to form the nucleus of a grazing area to be used in connection with the Buford-Trenton Irrigation Project being developed in the county.[4] The transaction will result in a very desirable adjustment in land use as well as placing the land in a position to return revenue to the county. The government will pay a service charge in lieu of taxes on the land whereas nearly all of it had been unleased previously and returned no revenue to the county.

The sale price of county-owned land in McKenzie County is based on a joint federal-state soils survey which was made for tax appraisal purposes.[5] All land in the county is given a percentage rating based on "ideal" cropland as 100. The county officials fix the money value of "ideal" cropland and then each tract of land in the county is appraised at the percentage of this value given as its final rating.[6] The values for various grades of land in McKenzie County, computed from the basic value on "ideal" cropland, are often considerably higher than the long-time, income-producing values established for the same grades of land by government land appraisers operating in the area. The indication is that the county officials are inclined to fix an unjustifiably high money value on the ideal cropping acre. The

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[4] Roy E. Huffman and James L. Paschal, "Integrating the Use of Irrigated and Grazing Land in the Northern Great Plains," *Journal of Land and Public Utility Economics,* February, 1942, pp. 17-27.

[5] M. J. Edwards and J. K. Ableiter, *Soil Survey, McKenzie County, North Dakota,* U. S. Department of Agriculture, Bureau of Plant Industry in cooperation with the North Dakota Agricultural Experiment Station, Series 1933, No. 37, March, 1942.

[6] Charles E. Kellogg and J. Kenneth Ableiter, *A Method of Rural Land Classification,* U. S. Department of Agriculture, Technical Bulletin No. 469, February, 1935.

amount of land held by McKenzie County has been greatly reduced in recent years by federal purchase of more than 450,000 acres of submarginal land in the county. Much of this land is the kind that would be likely to pass through the hands of the county officials at periodic intervals.

County land policy as illustrated by the above examples cannot be subjected to any great amount of criticism. Although many counties own large acreages of land, few counties own enough to warrant the employing of a full-time manager of county-owned land. In most counties, the management and sale of county land is handled by already overburdened county officials. County officials generally agree to the desirability of using the land resources at their disposal in adjusting the agricultural economy of their county but point out the fact that they do not have the necessary information on which to base such a program. Neither do they have the personnel or facilities for assembling such data. As a result of this situation, county land is usually sold to the first person who is able to present the required amount of money. In view of this situation, it is of importance to consider what has been done and what remains to be done to assist county officials in achieving a better utilization of their land resources.

State Legislation

The North Dakota State Legislature has passed three acts in recent years that are designed to facilitate the better management and wiser sale of county land. One of the three, approved in 1939, makes possible the ten year leases on grazing land previously referred to. The act provides that all leases of county-owned land shall be made subject to sale and shall be limited in length to five years except:

". . . . that in the discretion and sound judgement of said county commissioners, any piece or parcel of grazing land may be leased for grazing purposes without being subject to sale and for a term of not to exceed ten years to any duly incorporated cooperative grazing association or to any duly incorporated soil conservation district or to any individual within the State".[7]

This act has already had wide application. The availability of large acreages of county land under long-term lease has encouraged the formation of numerous cooperative grazing associations with county land as the nucleus. It has also made it possible for many individual operators to add stability to their individual units and develop a farming program with emphasis on livestock rather than grain production. The county land is generally in scattered tracts but, whether contiguous or not, is usually in sufficient quantity to provide the opportunity for securing control of an area. Privately owned land can seldom be secured in sufficient quantity to provide the necessary control.

A second act, passed in 1941, gives the county commissioners discretionary powers to refuse to sell land to individuals who will not make proper and efficient use of it. The commissioners are also empowered to specify the use to which the land may be put. This act declares it to be the policy of the state of North Dakota to encourage the best possible land use, to assist in the development of adequate, family-type farms and to discourage the acquisition of land by speculators. The county commissioners are empowered:

". . . . to put into effect the foregoing public policy by refusing to sell or lease in any manner such agricultural lands where in their discretion the person applying for such sale or lease will impair the fertility of such tract or adjoining lands . . . . . such lands by such sale or lease will become a part of an agricultural unit which will be too small or too large to be operated in conformance with the best interests of the community . . . . . the sale of such lands so held by the county would result in lessening the value or marketability of adjacent tracts of such lands held by the county. The county commissioners are further empowered to classify agricultural lands held by them so as to determine which tracts are properly usable for tillage and which tracts are usable only for haying or grazing purposes . . . . . applicants for deeds and leases upon county agricultural lands may file with the county auditor, before the time set for sale or leasing of such county agricultural tax lands, a statement . . . . . giving information as to the size of the farm unit for which such lands are applied, the uses intended therefore, and such other information . . . as the County Commissioners may reasonably deem necessary".[8]

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[7] Lease Provisions County Tax Deed Property, Laws of North Dakota, 1939, Chapter 237.

[8] Land Use Policy, Tax Deed Lands, Laws of North Dakota, 1941, Chapter 134.

County officials contend that this act is not really workable without changes in the state law regarding redemption of tax deed land. The former owner of a tract of land sold by the county has 30 days in which to redeem the land regardless of how long it has been in the possession of the county before the sale. Any other individual can gain the same redemption rights by securing a quit claim deed from the former owner. County officials point out that, though they may refuse to sell a tract of land to one individual and sell to a second person instead, the first person may be able to secure a quit claim deed from the former owner, redeem the land and invalidate the sale. There is considerable popular sentiment in favor of state legislation that would make it possible for no one but former owners who are actually operating the land to redeem it once it has entered tax deed action.

A third act, also passed in 1941, permits the county commissioners to exchange tax deed lands for other land within the county. The act authorizes the county commissioners:

". . . . . to exchange any lands, the title to which has been acquired by tax deed proceedings, for any other lands in the same county, when it is deemed advisable or for the best interests of the county that such exchange be made . . . . . the decision of said Board to exchange said lands may be appealed from as now provided by law; provided, however, that the Board of County Commissioners shall not be authorized or permitted to acquire title to any land through exchange for it of other property, unless the county shall receive full value in such exchange, and unless the land so acquired shall be free and clear of all liens and encumbrances".[9]

This act makes it possible for counties to consolidate their holdings of scattered, small tracts into acreages large enough to form adequate operating units and at the same time assist other land owners in blocking out desirable units. Such a program of consolidating land holdings would be to the advantage not only of the county but also to such other large land holders as the state of North Dakota, the federal land bank and various insurance companies. Even the largest land holders seldom own land in blocks large enough to form operating units of adequate size. Their holdings are usually scattered. This is a result of the small size of the original homesteads. Exchange of lands and the consolidation of ownership tracts into acreages of adequate size to form operating units would not only make the land more desirable from a sales standpoint but should also add stability to the unit, whether owner-operated or tenant-operated, by virtue of the entire operating unit being held in one ownership. Under the present ownership pattern, an operating unit of adequate size is usually comprised of a number of different ownership tracts and, in many cases, none of the tracts are contiguous.

[9] Permit Board of County Commissioners to Exchange Lands, Laws of North Dakota, 1941, Chapter 126.

Need For A Guide

It is evident that a great deal has been done to liberalize North Dakota laws governing the management and disposition of county land. It is equally evident, however, that county officials will hesitate to use their new powers without adequate information on which to base decisions. County commissioners are elected officials and, as such, their decisions are more often than not made with an eye to individual and popular reaction. It is doubtful if many county commissioners will actually adopt a policy of deciding to whom land can and cannot be sold unless such a policy can be based on direct recommendations of the people themselves. Land use planning committees in the various counties might well work out such recommendations as a guide to county officials in the management and sale of county land. Of course, it would be impossible for planning committees to make recommendations for all the individual tracts of land in the county and take account of all the contingencies which might arise. The recommendations must be general enough to be useful over a period of time and yet specific enough to serve as a guide in making decisions on individual tracts of land. The recommendations might well take the form of outlining the operating units of the county as the farmers themselves feel they should be if all maladjustments were eliminated and surplus population could be removed from the area. The number of operating units recommended for such an ideal agricultural economy would be much smaller in most counties than the number of units now ex-

isting. Recommendations would have to be worked out with a realization that a goal was being established which could not be reached for ten, fifteen, or twenty years and, in fact, would probably never be completely achieved.

Recommendations of this nature would undoubtedly be accepted by county officials as a guide in the management and disposition of county-owned land. When faced with the problem of making a decision with respect to sale, lease or exchange of a tract of land, the county commissioners could ascertain from the recommendations whether or not such a transaction would be a step toward the ideal operating unit pattern. In an instance of two bidders for a tract of land, the recommendations would provide basis for a decision as to which operating unit the particular tract of land logically should be a part. Just as important, it would make it possible for the county commissioners to refrain from permitting the reestablishment of operating units in areas which were overcrowded, populated to capacity, or which should be depopulated and restricted to grazing.

County officials are not the only ones who could benefit from such an operating unit plan. The federal land bank, state of North Dakota and other large landholders would undoubtedly welcome such a guide in the disposal of their lands. It would likewise be valuable in determining the disposal to be made of the dryland resources to be vacated by resettlement clients moving to new irrigation projects being developed as a part of the water conservation and utilization program.[10] In brief, the recommendations, probably in the form of a map, would be valuable to anyone interested in directing the efforts of all agencies toward a truly unified agricultural program in a county and stabilizing the agriculture of an area. It should be emphasized that in many instances the leasing of county land might be preferable to ownership. Once a sound program of county land management had been established, county officials could use the land retained in county ownership as a means of directing land use.

Adequate, family-type farm units are the basis of a sound agricultural economy. Many farms in western North Dakota are much too small to furnish full employment to the farm family and to secure maximum utilization of equipment. This is a wasteful situation at any time and is particularly serious now when there is a shortage of manpower and equipment. Farm units of the type making for the fullest utilization of manpower and equipment are especially important if agriculture is to make its full contribution to the war effort. Farm units adjusted to secure efficiency in war time will also be better able to survive in the post-war period. The situation presents a challenge to planning groups to prepare a guide that will serve all individuals and agencies in the development of the most desirable agricultural economy.

(Although valuable criticism and suggestions have been received from others, the views expressed represent only the personal opinion of the author.)

ROY E. HUFFMAN

Farm Security Administration
U. S. Department of Agriculture
Denver, Colorado

[10] Roy E. Huffman and James L. Paschal, "Integrating the Use of Irrigated and Grazing Land in the Northern Great Plains," *Journal of Land & Public Utility Economics*, February, 1942, pp. 17-27.

Public Utilities Department

Recent Utility Activities

Federal vs. State Regulation of Telephone Service

THE jurisdictional limits of state and federal regulatory commissions were clarified by a federal court decision, and were somewhat expanded as a result of a recent Federal Communications Commissions order.[1]

The first case grew out of the action of the Southwestern Bell Telephone Company in 1938 in establishing a larger *district* exchange area in the Kansas City, Missouri and Kansas City, Kansas region. As a result of this expansion, several smaller nearby suburban communities came within the zones of the new exchange area and lost their separate identity as exchanges. The company then withdrew certain interstate tariffs previously filed with the F.C.C. covering charges between some communities in Missouri and Kansas now zoned into the new Kansas City area. The F.C.C. investigated the change and in May 1941 ordered the company to file the new tariffs between those towns, claiming that mere reclassification of service could not be used to avoid meeting the requirements of the Communications Act.

The company claimed that such rates came only under the jurisdiction of the Missouri and Kansas commissions according to Sec. 221b of the Act,[2] and appealed to the federal district court. On May 28, 1942 in Southwestern Bell Telephone Co. vs. United States, the court ruled that the F.C.C. was excluded from jurisdiction, because it was obviously "the purpose of Congress to exclude the jurisdiction of the Commission in situations precisely like the one here discussed." Otherwise local supervision authority would be a sham.

The second case also involves the extent of federal jurisdiction. The Northwestern Bell Telephone Company announced in April 1942 that because of rising costs and taxes an increase in rates of 15% would be put into effect in May in the state of Iowa. The increase did not apply in some of the towns where interstate exchange service was rendered (e.g., Davenport, Dubuque, Sioux City, Northwood, et al.) but did apply in a few others. In as much as there is no state regulation of telephone rates in Iowa much criticism of the company arose for selecting that state among the first in which to initiate rate increases. Complaints received by the F.C.C. prompted it to ask the company to submit a complete statement as to the justification for a 15% increase in the *interstate service areas.* The following day the company withdrew the increase in the remaining interstate exchanges.

An interesting side-light on this rate increase came about when the Office of Price Administration also questioned the desirability of the raise. Although the O.P.A. is expressly excluded from control of public utility prices by the Price Control Act, it "requested" that rates not be increased. After a conference in Washington, D. C., on May 12 with O.P.A. and F.C.C. officials, the company voluntarily withdrew the increase throughout the entire state. This indicates that we may hear more about "regulation by request" during the war by a non-authorized body.[3]

[1] 128 Fed (2d) —— (1942); F.C.C. Docket 5672; Docket 6336.

[2] Sec. 221b provides that the Commission jurisdiction shall not include "charges . . . in connection with wire telephone *exchange* service, even though a portion of such exchange service constitutes interstate or foreign communication, in any case where such matters are subject to regulation by a state commission or by local governmental authority."

[3] The amendments to the Price Control Act, passed in October, 1942, require that any utility increasing its rates above those in effect on September 15, 1942, shall give thirty days' notice to the President or to such agency as he may designate, and shall consent to allow federal intervention before the authority having jurisdiction.

In spite of the cancellation of the rate increase in the interstate areas and later in the entire state, the F.C.C. has decided not to drop the inquiry and on June 26 announced its continuance. In addition it is proposed to integrate into the issue the question of why interstate tariffs were not filed with F.C.C. prior to 1942 in the interstate exchange areas, inasmuch as F.C.C. has apparently always had jurisdiction there. This situation differs from the Kansas City case because there is no state regulatory commission in Iowa and Sec. 221b is assumed not to apply.

If rates can be regulated in such interstate exchange areas by F.C.C. they can become the basis of comparison for adjacent areas not under federal control, and the scope of federal action can thereby become more effective. In states like Iowa, Delaware and Texas where no state control over telephones is provided for, broad interpretation of interstate commerce such as that being applied by the supreme court in recent labor cases might lead to extensive federal control of any company handling interstate messages.

Rural Electrification in Canada

As a self-liquidating, post-war employment project, Premier Bracken of Manitoba is now in the process of planning an extensive rural electrification program. This project is also part of an attempt to diversify Manitoba agriculture away from wheat to more home grown and consumed products. Early this summer an Enquiry Commission was established consisting of E. V. Caton, chief engineer of Winnipeg Electric Co., J. W. Sanger, chief engineer of Winnipeg Hydro, H. Cottingham, chairman of the Manitoba Power Commission, and E. P. Schmidt, chairman, of the University of Minnesota. The studies of the commission are now in progress and a report will be issued.

FLOYD R. SIMPSON
School of Business Administration
University of Minnesota

Public Utility Financing in the Third Quarter of 1942

THE volume of utility security offerings in the third quarter was very light continuing the decline which began after the outbreak of war in December 1941. The third quarter total was only $85 millions, the smallest quarter of record in this series which began in 1936. The totals for the same quarters in 1940 and 1941 were $244 and $480 millions respectively. The same trend is noticeable in other types of securities as evidenced by the current financial statistics in the standard financial journals.

TABLE I. SUMMARY AND ANALYSIS OF PUBLIC UTILITY LONG-TERM DEBT ISSUES OFFERED PRIVATELY, THIRD QUARTER, 1942

Company and Issue	Coupon Rate	Principle Amount	Maturity Date	Month of Offering	Offering Price	Offering Yield	Underwriters' Commissions	Proceeds to Company	Est. Incidental Exp.	Net Proceeds	Cost to Company
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
	%				%	%	%	%	%	%	%
Potomac Electric Power Co. First Mortgage	3¼	$ 5,000,000	1977	Sept.	113.00	2.67	.73	112.27	.91	111.36	2.74
Southwestern Public Service Co. First Mortgage	4	20,000,000	1972	Sept.	107.50	3.59	3.35	104.15	1.55[1]	102.60	3.84
Total or Weighted Average...		$25,000,000			108.60	3.41	2.83	105.77	1.42	104.35	3.62

[1] Pro rata share of expenses, including estimated expenses in connection with the plan of integration submitted to the Securities and Exchange Commission.

The third quarter total of $85 millions includes 2 issues totaling $25 millions of publicly offered long-term bond issues, 12 issues amounting to $45 millions of privately offered long-term bond issues, 3 issues totaling $9 millions of serial notes, and a single issue of preferred stock in amount of $6 million. Except for the serial notes these totals are considerably below the volume in previous years.

The proportion of long-term bonds sold privately as compared with public sales was just the reverse of the previous quarter. The third quarter percentage sold privately is 64% as compared with 30% in the second quarter. The volume of privately offered long-term bonds issued in the third quarter exceeded the second quarter volume although the volume in both quarters was below average. This accounts for the reversal in the proportion sold privately as described above. The scarcity of issues, however, makes any conclusions regarding the trend of this interesting controversy unreliable.

Long Term Debt Financing. Public offerings of utility long-term debt issues are listed in Table I. The weighted average offering yield is 3.41%. While the average is slightly higher than in any quarter of the period 1940 to date, it is not indicative because of the small number of issues offered in this period. The volume is the smallest in any quarter since this series began (1936 to date). It is noteworthy that one of the issues, the Potomac Electric Power Company's 1st mortgage, 3¼'s of 1977, principal amount of $5,000,000 was offered at 113 to yield 2.67%. The net cost of this loan to the company was 2.74%. This issue compares with another issue offered by the same company in September 1940 (1st mtge. 3¼% of 1975 in amount of $10,000,000) sold at 108.35 to yield 2.83%.

TABLE II. SUMMARY AND ANALYSIS OF PUBLIC UTILITY LONG-TERM DEBT ISSUES OFFERED PRIVATELY—THIRD QUARTER, 1942

Company and Issue (A)	Coupon Rate (B)	Principal Amount (C)	Maturity Date (D)	Month of Offering (E)	Offering Price (F)	Offering Yield (G)
	%				%	%
Boise Water Corp.						
First Mortgage	3½	$ 950,000	1962	July	101.50	3.40
Eastern Kans. Utilities, Inc.						
First Mortgage	3½	990,000	1967	July	101.00	3.44
Philadelphia Suburban Water Co.						
First Mortgage	3¼	475,000	1971	July	[1]	[1]
Brockton Edison Co.						
Ten Year Notes	3	1,900,000	1952	August	[1]	[1]
Consumers Public Serv. Co.						
First Mortgage	4½	225,000	[1]	August	[1]	[1]
East Missouri Power Co.						
First Mortgage	3¾	218,000	1967	August	105.02	3.45
Missouri Edison Co.						
First Mortgage	3¾	550,000	1967	August	101.52	3.66
Southbridge Water Supply Co.						
Debentures	3¼	300,000	1972	August	101.00	3.20
Southern Bell Tel. & Tel. Co.						
Debentures	2¾	35,000,000	1972	August	98.50	2.82
Edison Sault Elec. Co.						
First Mortgage	3¾	990,000	1972	Sept.	104.00	3.53
Home Tel. & Tel. Co.						
First Mortgage	3¼	2,500,000	1967	Sept.	[1]	[1]
Inter-Mountain Tel. Co.						
First Mortgage	3	1,050,000	1972	Sept.	[1]	[1]
Total or Weighted Average		$45,148,000				
Total or Weighted Average (excluding issues for which complete data are not available)		38,998,000			98.87	2.89

[1] Information not available.

TABLE III. COMPARISON OF RECENT LONG-TERM DEBT ISSUES OF AMERICAN TEL. & TEL. COMPANY AND SUBSIDIARIES

Name of Company	Description	Amount (millions)	Issued	Term	Offering Price	Offering Yield
Am. T. & T. Co.	Deb., 2¾%	$140	1940	30	98.50	2.83%
ell T. Co. of Pa.	1st & Ref., 2¾%	20	1941	35	100.00	2.75
Ill. Bell T. Co.	1st Mtge., 2¾%	4	1941	40	102.00	2.67
Am. T. & T. Co.	Deb., 2¾%	90	1941	35	101.84	2.67
So. Bell T. & T. Co.	Deb., 2¾%	35	1942	30	98.50	2.82

The long-term bond issues sold privately are listed in Table II. There are 12 issues shown in the table. The weighted average yield is 2.89%. The latter figure is greatly affected by the rather large offering of one of the associated companies of the Bell system. The issue referred to is the $35,000,000, 2¾% Debentures of the Southern Bell Telephone and Telegraph Company maturing in 1972 and sold at 98.50 to yield 2.82%. This issue is compared with several other issues of Bell Associated Companies offered in since January 1940 in Table III.

The Southern Bell Telephone and Telegraph issue compares favorably with the other issues in the above table. The offering yield is the second highest but the difference is not great.

Other Utility Financing. Issue with serial maturities offered in the third quarter are listed as follows:

$1,000,000 New Bedford Gas and Edison Light Co. 3% Serial Notes due 1957 priced at 101.50.

1,750,000 California Oregon Power Co. 2⅞% Serial Notes due 1947-1952.

6,000,000 Southwestern Public Service Co. 2½%-3% Serial Notes due 1943-1954, priced at 97.09 to 102.29.

$8,750,000

There was only one preferred stock issue offered during the quarter Southwestern Public Service Company offered 60,000 shares ($6,000,000) of $100 for 6½% cumulative preferred stock at $100. The same company also offered 185,000 shares of common stock (par $1.00) at $5.00 per share.

R. G. DUDLEY
Statistician
Public Service Commission of Wisconsin

W. H. EVANS
Assistant Rate Analyst
Public Service Commission of Wisconsin

Book Review Department

The Problem of the Cities and Towns. Report of the Conference on Urbanism. Edited by Guy Greer. Harvard University, March 5-6, 1942. pp. 116.

The Conference on Urbanism at Harvard University on March 5 and 6, 1942, in which 38 leading planners and housing economists participated, was a recognition of the increasing attention being given to the most vital urban problem of our times—the need for the replanning and rebuilding of our cities. This does not mean that our present urban sites should be abandoned, for as Mr. Edgar H. Hoover states, the existence and location of cities depend upon fundamental facts of transportation, and the future, accelerated railroads, airways and super highways should increase the relative importance of great metropolitan centers. There will be a change in the future urban structure, according to Mr. Hoover, mainly as a result of the location of large modern war plants on the periphery of cities which, when converted to peace-time production, will lead to the building of a new residential belt in the vacant areas between the city proper and the outer ring of new factories. Mr. Dal Hitchcock pointed out that these new war plants have been chiefly located in existing industrial areas with the result that established cities were strengthened rather than weakened by the war.

The Conference next devoted itself to the problem of rebuilding the most decayed parts of present cities or the blighted areas. Mr. Earle S. Draper of the Federal Housing Administration emphasized the importance of reconstructing the core of the city by acquisition or condemnation through adequate Urban Redevelopment Laws. Mr. T. T. McCrosky of the Chicago Plan Commission emphasized that the realization of an orderly future land use pattern for the city involved the coordination of private and public works and the enactment of enabling laws and procedures. He urged as a unit for rebuilding residential areas, the use of the super block or the neighborhood with fewer and better streets planned to pool space instead of losing it in separate side and back yards. Mr. McCrosky also suggested that provision be made for housing every income group in the redeveloped areas, and he pointed out that steam-heated apartments renting for from $6 to $12 a month per room in large cities represented a type not touched by the U.S.H.A. or the F.H.A. or private construction. Mr. Guy Greer of the Federal Reserve Board urged that land uses in the interior of cities be much less intense than heretofore and that the chief aim of city planners should be to have people live as near as possible to where they work, in order to eliminate useless and time-consuming travel.

Having thus defined the objectives in urban redevelopment, the last session was devoted to the role to be performed by the federal, state and local governments in this gigantic undertaking. Mr. Guy Greer pointed out that, while the main task of urban redevelopment should fall on private enterprise, it was necessary first, that the states give cities adequate legal powers to control their land areas, and second, that excessive land values in blighted areas be reduced before privates operators could function. Mr. Greer proposed that the federal government should offer financial aid to towns and cities for redevelopment on condition that (1) state legislation be enacted comprehensive enough to enable the cities to do the job, (2) adequate local planning agencies be set up, (3) such agencies must have replanning authority over the entire natural community of the central city and its suburbs, and (4) aid from the federal government would not constitute an addition to the local government's debt but an obligation to be repaid only from part of the proceeds derived from leasing the land for redevelopment.

This report on the Urbanism Conference also presents memoranda, short comments and illuminating observations by many other participants at the sessions, which deserve the careful attention of students of the city. It is not possible of course to present in the course of a review even a digest of the opinions of 38 authorities on the numerous aspects of the problem of redeveloping our urban communities. A report of a series of discussions, into which many different views are interjected, must necessarily lack the unity of a well organized study by a single author. One of the chief virtues of this volume, however, consists in this interaction of ideas between men of widely different backgrounds. It is a report that should constitute the beginning of the attack upon the most serious urban problem of today.

HOMER HOYT

Chicago Plan Commission.

The Investor and the Securities Act. By Homer V. Cherrington. Washington: American Council on Public Affairs, 1942. pp. 225. $3.00.

This is a compact, well written book, and worth reading by all those interested in the problem of protecting the investor and maintaining capital markets, although it is not a final and definitive study.

The nine chapters deal with the "Setting for Federal Control," Proposals for Reform Prior to 1935," "The Securities Act," "The British Precedent," "The Securities and Exchange Commission," "Significant Forms of Misrepresentation," "Underwriters Since 1933," "The Responsibilities of Accountants," and "The New Controls."

The conclusions contained in the final chapter are, in general, sound. They show that the common stockholder is not protected by the Securities Act and its supplementary legislation from payment of excessive rewards to promoters, the purchase of property at excessive prices, the sale of stock at varying prices, the sale of assets at low prices to purchasers with whom the issuers are affiliated, nor from speculation in securities on the basis of inside information or modification of claims to assets and income.

Furthermore, "the Securities Act has proved no protection to preferred stockholders who may be virtually forced to surrender their stock and their claims to accumulated dividends in exchange for other securities."

On the other hand, the bondholder's position has been considerably improved by the Bankruptcy Law of 1938 and the Trust Indenture Act of 1939.

Minor criticisms of the application of the Securities Act are perhaps over stressed by the author. While it is true that much of the Commission's activity is secret, it is doubtful if this is as dangerous to our democracy as secrecy on the part of security purveyors. It is also doubtful if the Act has injured many small and worthy firms and even if it has, the saving to small and worthy investors may more than compensate for their loss.

It would be interesting to know what the author thought regarding the further extension of government control over securities issues. Should this control aim to direct capital flow on other principles than protecting the investor and the profit motive? If so, should the power be placed in the hands of the Securities and Exchange Commission?

Perhaps the author was unable to answer these and other questions because so much of the enforcement activity is not a matter of public record but must be inferred from the decisions rendered and this is a risky basis for judgment.

PHILIP L. GAMBLE

Massachusetts State College

Economic Problems of War. By George A. Steiner and Associates, New York, New York: John Wiley & Sons, Inc. (London: Chapman & Hall, Ltd.), 1942. pp. 644. $3.50.

The purpose of this volume is to provide "the descriptive and analytical material which will throw light upon the economic problems of total war." The book is essen-

tially descriptive but illuminated throughout by the interpretations of public policy and the theoretical analyses of a group of competent chapter authors. It is a book for the intelligent layman rather than the technical economist, since it gives a chapter to each of a wide variety of wartime economic problems.

Part I is a concise description of the characteristics of a war economy and the economic resources with which the United States went into the war. Part II analyzes the economic war organizations of Great Britain, Germany and Japan and is one of the most valuable features of the book. Part III presents in some detail the economic reorganization under way in the United States in early 1942. Price control, Federal fiscal policy, monetary policies, consumer credit control and rationing, production control and the financing of war production are discussed in considerable detail. Another group of important war time economic situations are considered in Part IV —the labor market, transportation, strategic raw materials, housing, insurance and agriculture, and the effects of the war upon retail merchandising.

The descriptive presentation in these first four parts of the work form the basis for a more theoretical analysis in Part V, which deals with the general economic costs of war, the problems of postwar reconstruction, the economic bases of permanent peace and the outlook for capitalism in the postwar period.

It is impossible, in the space of a review, to summarize the points of view and interpretations of the 20 authors who have contributed chapters to this book. The reviewer instead expresses the opinion that this book, because of its essentially factual character, is distinctly worthwhile and deserves wide reading.

DON D. LESCOHIER

University of Wisconsin

The Price of Milk. By R. W. Bartlett, Danville, Illinois: Interstate Press, 1942. pp. 171, $1.75.

This is a book which one reads with considerable care because the issues are made clear; the arguments are pointed and not lost in a maze of extraneous material. The first part of the book deals with some of the problems of market-milk distribution, stressing the history and possibilities of conspiracy in the industry. To one not thoroughly acquainted with problems in milk distribution, this proves to be particularly illuminating.

Professor Bartlett asks the question whether there is any postulated price that will bring about efficient distribution. Some of his main arguments against government control are: the actions of authorities lag behind the fluctuations of the market; control has not increased milk consumption; prices to consumers have not been lowered; and the farmers' share of the consumers' dollar has not increased. In general these arguments do not leave the realm of price and margins. This rightly stays within the scope of the book but cannot be taken as a complete indictment of public milk control whose purpose is as much to conserve resources as to determine equities and make allocations of costs and income. The author shows, later in the book, that social efficiency is the major goal in milk control but does not sufficiently recognize that everything gained in this direction does not reveal itself in price.

That consumers' prices have not been lowered through government control is not necessarily an index which shows that no efficiency has been gained. It may be related to a quotation from H. M. Gray on page 50. Part of this quotation reads: "While I believe such a course (government control) can be justified theoretically on legal, economic and social grounds, I am extremely dubious of the proposal." This was quoted immediately after a review of the relatively successful government control of milk prices in Italy. Neither Gray nor Bartlett gives any fundamental reason for his dubiousness, except that it has not worked out in the United States. What Dean Gray omitted in his "grounds" for justification was *politics*. Unfortunately it is less difficult for the administrator of a public utility to organize his producer constituents into a supporting pressure group than it is to organize and educate the consumers and of course scarcity is just as important as effi-

ciency to the producer group. In Italy the support of either group of constituents very probably has not been necessary, giving the administrator free reign in attaining efficiency.

The argument is advanced that government-fixing of milk prices fails "by closing alternative sources of supply to small dealers at prices less than those established..." (P. 35). The reason for this is not elaborated but it is very likely the case that the functions of small dealers are more varied than those of large dealers. If this is the case, the price margin, fixed the same for all dealers, must act as a compensation for more services in the case of the small dealers. Under a competitive system the small dealers have probably been able to stay in business by paying lower prices to producers and offsetting it by exacting less of the services from the producers. Neither the facts nor the merits of this have been tested and offer a field for research for either the price or efficiency expert.

Professor Bartlett advocates a flexible price system based mainly upon the price of butterfat and cheese. He says of California that: "It is noteworthy that at least one state, recognizing the advantages of the flexible milk price system..." (p. 66). However, although the California act does prescribe a price based on the competitive uses of milk, only minimum prices are thus prescribed. The system is flexible only in one direction and is primarily a reason for not bringing about savings to consumers—a factor Bartlett has earlier brought out as an undesirable feature. In the formula recommended, the value of skim milk is calculated as a percentage of the value derived from butterfat and cheese prices. In order to make this more realistic, from the standpoint of opportunity costs, it would probably be more logical to base the value of skim milk on the price of competitive feeds —such as the price of meat meal.

The argument is advanced that prices built out of a statutory formula are more democratic and not dependent upon the order of a single administrator. This is perhaps in itself no measure of merit but one must agree with Bartlett that it will probably result in less disagreement and litigation and relatively easier forecasting. The administrator's position is made relatively less difficult if his judgment is authorized within narrow limits. However, it should be recognized that a statutory provision of this type is a restriction and does not necessarily provide any more flexibility than would its omission. In fact, the omission of the formula from the statutes, without an alternative, would not bar the administrator from using any formula that could have been prescribed in the statutes. The main difference in the two methods is who makes the decision and how frequently it can be changed.

The last two chapters in the book deal with the cost and techniques of controlling the quality of milk and the history of antitrust enforcement. It is shown that some of the measures disguised as quality control have been instituted by pressure groups, have not improved the quality and have served as barriers to efficiency. There is a quite complete list of references and an index.

NORMAN NYBROTEN

University of Idaho

American Highway Policy. By Charles S. Dearing. Washington, D. C.: The Brookings Institution, 1942, pp. 278. $3.00.

This little volume on American Highway Policy, written for the Brookings Institution by Charles L. Dearing, is a fine example of that organization's research activities which have added so much in recent years to our understanding and appreciation of current economic problems. While not research of an original type, it is nevertheless of a high order in that this study is based upon the best available information derived from original data compiled by relevant governmental agencies and submits these data to such correlation, analysis and interpretation as to bring out of them the more significant conclusion with respect to the economic aspects of highway policy.

The study begins with a brief but interesting account of the evolution of highway policy in the principal European countries and in the United States. Next, it presents a general picture of the present system of highway management which is followed by a chapter setting forth the system of high-

way revenues by means of which our highway plant is financed and maintained. The "striking dissimilarities" with respect to administrative and financial methods which exist among the states are noted and an investigation of the causes underlying such diversity constitutes the heart of this study. In a series of chapters the author examines into the purposes and beneficiaries of highway facilities, and into the way in which managerial responsibility should be distributed among the various levels of government and the financial burden equitably apportioned among the various distinguishable beneficiaries of highway services. This leads naturally into a consideration of the competitive situation which exists as between highway users and railway users. Upon this point the study concludes that even after all important elements of subsidy have been largely disposed of by allocating the major costs of general purpose roads to motor vehicle users by means of special charges graduated according to types and degrees of use, highway users in competition with railway users would still retain certain joint use advantages with respect to capital costs and certain advantages in tax contribution whose incidence is upon the general taxpayer.

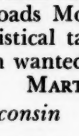
At this point the author himself recognizes the chief limitation which may be said to inhere in his study in the following brief summary: "These capital cost and tax advantages must be removed if the goal of national policy is to be absolute equalization of competitive opportunity between highway and railway transportation. We have found, however, that such equalization cannot be brought about by measures directly involving highway financing without conflicting with some of the principles of logical, economical and equitable highway management and without encountering serious practical difficulties. The desirability of adopting such measures must therefore be determined with reference to overall national transportation policy. These special issues cannot be assessed adequately within the limited framework of the present study."

Noting the above disclaimer, the book is nevertheless a substantial contribution to highway economics. The practical recommendations are solid and sensible and appear to this reviewer to have the additional merit of being easily translated into positive action, to wit: "Specifically, we have proposed the designation in each state of a scientifically constituted system of general purpose roads, with primary jurisdiction vested exclusively in state agencies, and with the major financial burden assigned to motor vehicle users. Inclusion or exclusion of mileage in these general purpose systems, as well as standards of improvement, would be governed exclusively by criteria of intercommunity mobility."

An additional feature of this little book is an appendix which recounts the history of the "Good Roads Movement" and the well selected statistical tables which afford information often wanted by the specialist.

MARTIN G. GLAESER

University of Wisconsin



Farm Management and Marketing. By V. B. Hart, M. C. Bond, and L. C. Cunningham. New York: John Wiley & Sons, Inc., 1942. pp. vii, 647.

The origins of this volume are found in ". . . the general point of view and . . . the teaching materials that have been developed in the Department of Agricultural Economics and Farm Management at Cornell University." Both the virtues and faults of the book stem from this background. One could wish that the authors had applied to themselves some of their categorical imperatives about balance, diversity and combination of enterprises. Had they done so, the helpful chapter end references might have extended somewhat farther beyond the boundaries of Cornellian thinking. There might then have been a little more leavening of the excellent factual approach with references to underlying economic principles. Perhaps the elemental fatalism that seems to flow from the contemplation of 100 years of northeastern agricultural history would have been lifted in truer perspective against the different history of other regions. Possibly more doubts would have arisen about the mass use of statistics to clinch particular points. Maybe the telling and witty use of shrewd and pithy statements would have been more circumscribed.

But "gold" is where you find it and some of the best gold of Cornell is found here. One must heartily agree with the authors that "anything which affects the income of the farmer might well be included" in such a book. The various chapters cover the Cornell approach to farm management, marketing, credit and prices. Marketing of dairy products and fruits and vegetables are given extended treatment.

The sections on farm layout and insurance are particularly good examples of practical problems in which the factual approach produces excellent results. The chapter on land use gives a very clear description of the New York system of land classification. Six photographs reveal at a glance the general basis on which the system rests. Another illustration of excellent descriptive presentation occurs in the section on milk prices and marketing. Occasionally the treatment is marred by over-conclusive statements. For example: "It is impossible to increase greatly the consumption of fluid milk by lowering the price." Opinion on that is certainly veering to a point short of the impossible.

Probably the least satisfactory part of the book is the farm management section in which most of the space is devoted to size of business, labor efficiency, rates of production and combination of enterprises. Much of the information is useful and good. The discussion represents little advance over Warren's original treatment.

There is altogether too much reliance on massed empirical evidence and upon rules of thumb. Does it really help to lay down the rule that "Under normal conditions, it pays to develop a size of business to approximately double the average size in the community"? (p. 88)

One would expect after reading the well developed discussion of budgeting the farm layout, that an equal place would be allotted for the far more important problem of budgeting the farm business plan. But the chapter on farm accounts stops short of this point.

Any agricultural economics text written in Ithaca must include something about gold and prices. The interesting thing about this volume is that after setting up the claim that changes in supply of and demand for gold is the only explanation for changes in the general price level for which there is ample proof, the text then shows that this is no longer so. True, we are still "tied" to gold but apparently many things are possible. Furthermore, the conclusion is reached that stabilized prices are possible through varying the gold content of the dollar. A great deal is packed into a small capsule for high school dosage.

All in all, this book will be found very useful especially for secondary schools and colleges in the northeast. As the authors suggest, it will need to be supplemented with appropriate additional material. Even professional agricultural economists will find it profitable reading to refresh their memory of the old school tie or of the other fellow's point of view.

RONALD L. MIGHELL

Bureau of Agricultural Economics
U. S. Department of Agriculture

An Examination of Basic Principles of Comparative Forest Valuation. By Roy B. Thomson. Durham, N. C.: Duke University, School of Forestry, Bul. 6, 1942, pp. 99.

Valuation is a necessary part of forestry, whether carried on by public or private owners. The purpose of this monograph is to clarify the basic principles pertaining to forest valuation. The author divides forest valuation into two major fields, namely, (1) the appraisal of actual values pertaining to existing forestry enterprises, and (2) the appraisal of estimated values pertaining to proposed forestry enterprises. The author designates this latter field "comparative forest valuation", and defines it as being "the appraisal of value of potential wealth in purposeful forestry and comparison with values of existing wealth in forests and other forms of use of land and capital." The purpose of this type of valuation is to determine which one of two or more proposed forestry undertakings probably will be more profitable to the investor. This publication is confined entirely to a consideration of comparative forest valuation as such.

The "gross yield", "soil rent" and "forest rent" theories ("doctrines") of forest valuation are summarized and critically analysed. The conclusion is reached that the "soil rent" theory is the only one of these theories that is economically sound. According to the soil rent theory the value of the land for each of the proposed uses to which it may be put is determined by discounting to the present time, at an appropriate rate of interest, the difference between the expected incomes and expenses pertaining to each proposed use for the land. Compound rather than simple interest should be used in the discount calculation because the use of the land for forestry purposes involves periods of time running to many years between successive incomes and also between some of the successive expenses. Simple formulas only are required to carry out these calculations. The formulas needed are given. In making these calculations the author strongly recommends the use of a risk free rate of interest, which, for the United States, appears to be about three per cent. The use of such a rate of interest will avoid undesirable distortions in the calculated values of the land for the different proposed uses that would occur if higher rates of interest were used.

Comparative forest valuation, using the soil rent formula, can and should be used, for example, (1) to determine the most profitable future use of a specific piece of land, (2) to determine what kind or kinds of trees should be grown, and (3) the age at which the timber should be cut. The soil rent formula should be used to arrive at answers to these and other questions because it is based on sound economics (the expected economic rent to be earned by the land if devoted to a proposed use). The "gross yield" and the "forest rent" formulas are inappropriate for these purposes because they ignore the law of diminishing returns.

Many foresters have felt and many still feel that there is little or no place in forestry for the calculation of values based upon soil rent. The author of this monograph shows clearly that, in the management of land and forests, there is an important place for such calculations if the land or the forest upon it is to be intelligently managed. He has made a highly valuable contribution to the American forest valuation literature.

J. H. ALLISON

Division of Forestry
University of Minnesota

Editors Page

Milestones. This issue of the *Journal* completes eighteen years of publication, and the first volume since its return to Wisconsin. We are pleased by the substantial increase in number of subscriptions. Unsolicited manuscripts have been submitted in sufficient numbers to assure the Editorial Board that, in spite of the pressures of war-time responsibilities, there continues to be a lively devotion to land and public utility economics. Realistically we face the days ahead when we must move along under war-time conditions. An inventory of our assets, expressed in terms of finances and in good will, gives real encouragement for the future.

"Aside from the War, everything is rosy."

So writes one of our subscribers from a university in war-torn China. The reading of such messages reminds us that this *Journal* is helping to fill a need in the scientific libraries of other lands. Printed below are verbatim paragraphs from several such letters. It is hoped that a number of back copies can be set aside for future distribution.

From National Central Library, Chungking, China. ". . . Owing to our hurry departure from Nanking, more than 200,000 volumes fell into the hands of the Japanese, who set them, together with the collections of other institutions, on fire. At the present moment, tens of thousands of students and scholars in China are entirely devoid of means to advance their studies. It is my crusading responsibility and pleasure to write for complete sets of your publication."

From Sun Yat-Sen University Library, China. ". . . This library, after a long journey, thru thick and thin, has finally removed from Canton to Chengkiang, and back to Nan-Hsun. As we departed from Canton at the eleventh hour, a large part of our books were left behind to an unknown destiny. We have suffered an incalculable loss. However, we are by no means down-hearted. We are standing firm and working hard."

From Nankai University, Chungking, China. ". . . At the opening of the war, the Nankai Institute of Economics was the first cultural institution to suffer from bombardment and fire. Since then, the Institute has undergone hardships in its long trek westward to China's great southwest, and finally has settled in the outskirts of Chungking. Buildings may be destroyed, but the elements which make this institution what it is — outstanding in the field of economics in China — are indestructible. The importance of the Institute remains in the high calibre of the research among faculty and students, and not in its buildings. Aside from the war, everything seems rosy except for one main item — library facilities. Our handsome library collection in economics — one of the most complete in all China — was salvaged by earlier transference to the concessions in Tientsin, and subsequently removed to Hongkong. It has not been possible to remove such books from Hongkong. In view of these difficulties we appeal to your friendship to send us any copies of your publication, no matter how old or used."

Publication Problems. This *Journal,* like all others, is experiencing unusual situations in its editorial office. A capable office secretary, Horton L. Roe, was called into the Navy on less than twenty-four hours notice; and it was more than three weeks before a successor was found. The rapid and successive changes in residence of authors during the period when their manuscripts are being read causes delays; and manuscripts coming from government officials usually must have approval of the Washington department concerned. Frequently articles are of such timely interest that statistical data are changed while the manuscript is in the process of final printing. The most recent development to stand in the way of maximum efficiency in the Editor's office is an order from the state printing board which forces a change in printers! If your copy is received later than its normal due date, remember the *Journal* is also "in the war."

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of *Journal of Land and Public Utility Economics* published quarterly at Madison, Wisconsin for November 1942.
State of Wisconsin, County of Dane.

Before me, a notary public in and for the State and county aforesaid, personally appeared Mary E. Amend, who, having been duly sworn according to law, deposes and says that she is the Managing Editor of the *Journal of Land and Public Utility Economics* and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, University of Wisconsin, Sterling Hall, Madison, Wisconsin, Managing Editor, Mary E. Amend, Sterling Hall, University of Wisconsin, Madison, Wisconsin.
2. That the owner is: University of Wisconsin, Madison, Wisconsin.
3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

MARY E. AMEND, *Managing Editor*

Sworn to and subscribed before me this 9th day of December 1942.

[SEAL.]

Mary A. Klusmann
(My commission expires 7-14-46)

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